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VOL. 16. NO. 6 JUN 17 1918 REGISTERED IN U. S. PATENT OFFICE JUNE, 1918

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THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED

THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:

ELECTRO-PLATERS REVIEW

A MONTHLY JOURNAL RELATING TO THE METAL AND PLATING TRADES

"THE WISE BUYER BUYS STEVENS SUPPLIES"

These Two New Features Save Its Cost in Short Time

My No. 5 Double Independent Spindle Ball Bearing Lathe

My No. 5 Double-Independent-Spindle Ball-Bearing Polishing-and-Buffing Lathe has TWO INDEPENDENT spindles.

EACH has tight and loose pulleys and belt shifters.

Either operator may start or stop his spindle without interfering with the other.

Either spindle may be removed from the machine without disturbing the other operator.

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All loose pulleys are equipped with moccasin bushing—they will run SIX MONTHS with but ONE oiling.

Built like a WATCH—all parts interchangeable.

May be belted from above or below (through the hollow base). When below, a cover encloses the belts.

When shifting belt to loose pulley, a brake applied, quickly stops the rotation of the spindle.

The spindle locking device facilitates changing wheels.

Lathe furnished complete with belt shifters—with cover for underneath drive—or without cover for overhead drive.

Let me send you at once, specifications of this modern, saving equipment.

Also write for my three new Bulletins —just off the press:
"Suggestions for Brass Foundrymen,"
"Polishing and Buffing Lathe Bulletin"
and
"Electro-Plating Equipment Bulletin."

FREDERIC B. STEVENS

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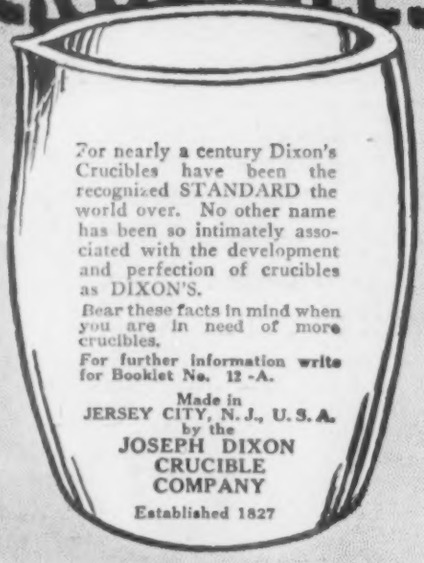

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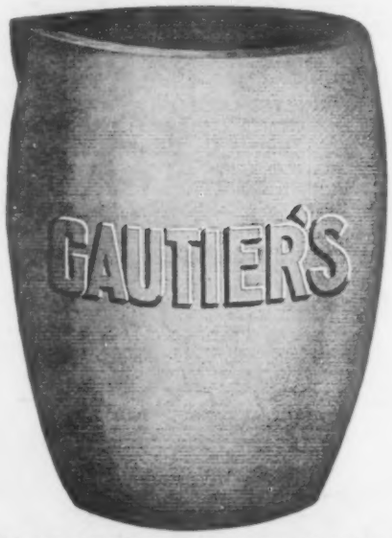

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THE METAL INDUSTRY

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THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:

ELECTRO-PLATERS REVIEW

Vol. 16 NEW YORK, JUNE, 1918. No. 6

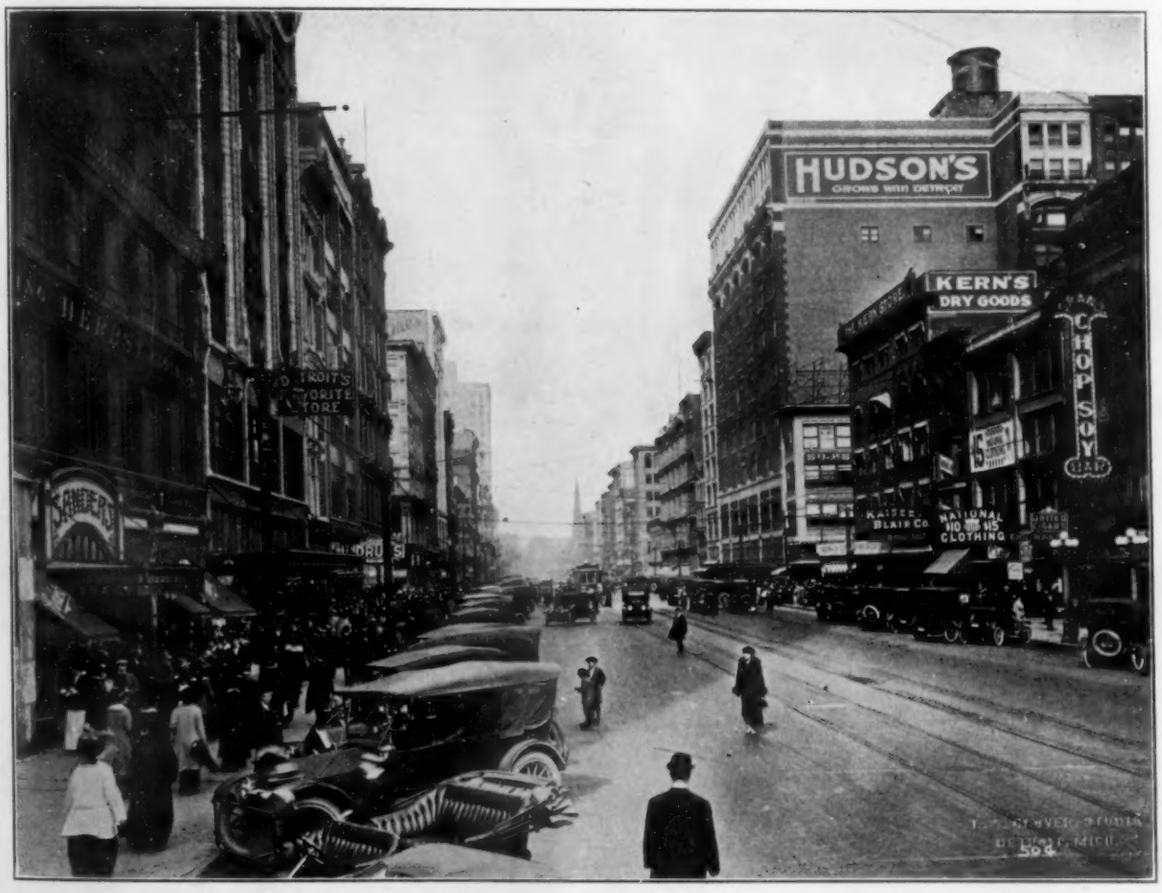
AMERICAN ELECTRO-PLATERS' SOCIETY CONVENTION.

A Description of the Metal Plating and Finishing Shops of Detroit, Mich., the Convention City of 1918, Telling How It Became a Plating and Polishing City.

Written for The Metal Industry by Fred J. Huntley, Business Correspondent.

THE FIRST JOB PLATING SHOP.

Way back in 1875, when Detroit was an overgrown country town, a young man, forseeing the possibility of a good thing, established the first job plating plant at 101 Miami avenue, this street now being known as Broadway. For a number of years he had, so the story goes, been employed by the Michigan Stove Company, and came originally from Meriden, Conn., where he had learned the polishing and plating business. The plant was first opened in his residence which stood for years in a quiet home section of the city. Here he established in his kitchen a potash kettle that is said to have held about 25 gallons and manufactured his own batteries according to directions obtained from his eastern instructors, and built up a thriving plating business.



A VIEW OF ONE OF DETROIT'S MAIN THOROUGHFARES. WOODWARD AVE. LOOKING NORTH.

This plant at the time was regarded as quite a novelty owing to the many ingenious contrivances employed to facilitate production. It was started principally for plating silverware and at that time the method employed is said to have been protected by patents. For a number of

years he paid a good royalty, but notwithstanding this handicap was successful and continued vigorously in the business until his death. His name was Edward Bromley, and up to the present time the Bromley Electro Plate Works stands as the oldest business of the kind in the city.

Mr. Bromley continued active as a plater until 1891 when he died an honored and respected business man. He still is recalled in memory by many older residents, and there are gray haired men today who remember as boys having stood before Mr. Bromley's establishment and watched him perform wonderful feats by transforming unsightly knives, forks and spoons into bright and attractive tableware. His descendants are still living in Detroit, the name being as honored and respected as it was 40 or more years ago.

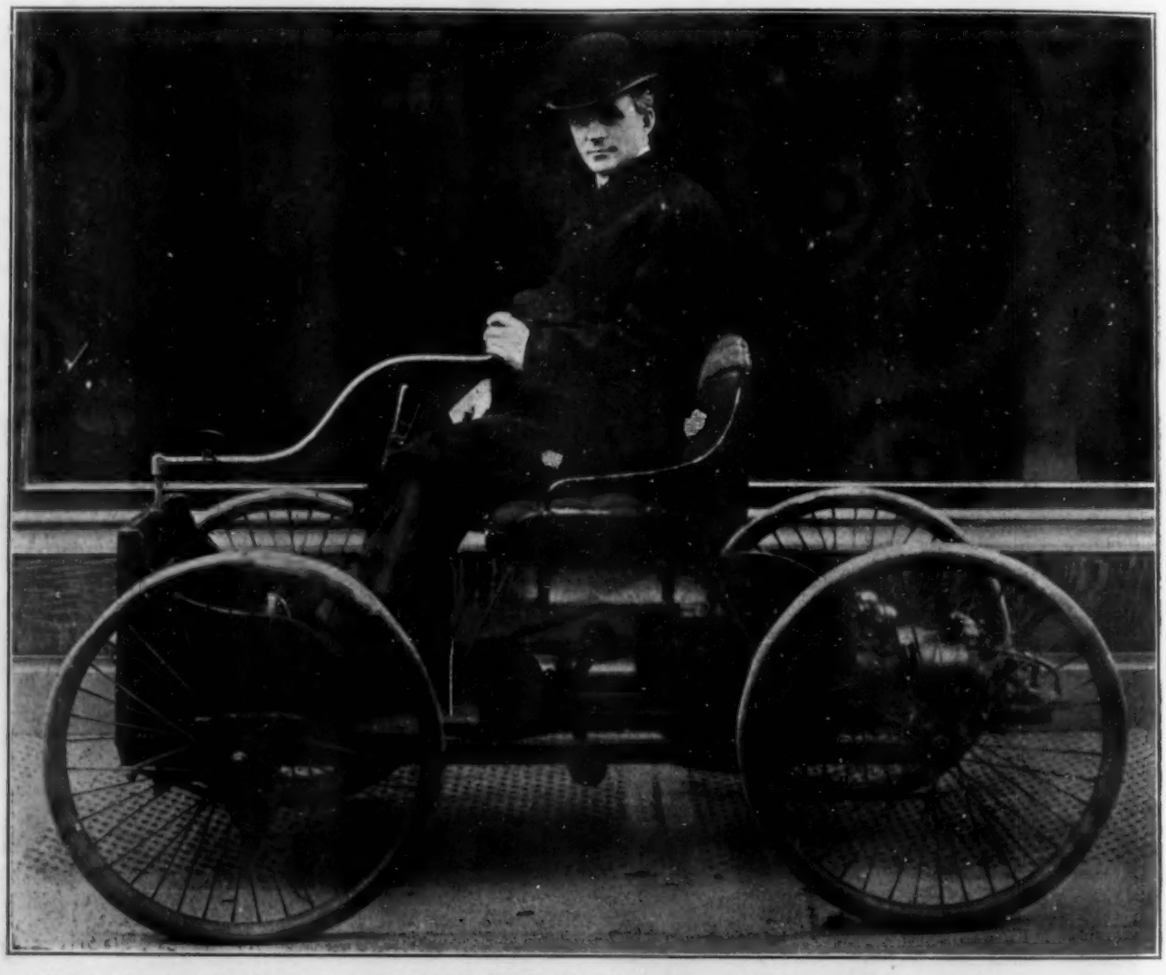
As the Bromley electro plating business progressed, the proprietor employed assistants, and among the most active and energetic was a young man known as Barney Nehls. He was employed for years as a skilled plater by Mr. Bromley and worked himself up to a confidential position. When Mr. Bromley died Barney Nehls' opportunity for advancement came and he at once took advantage of the opening. He had saved and was able to furnish sufficient capital to take over the business, which is now operated under his name, although he still clings to the old trade style of the Bromley Electro Plate Works, the plant for a number of years being located at 248 Brush street in the heart of the city.

Mr. Nehls now has a finely equipped plant. The old potash kettle was discarded years and years ago, and in its place may be found great dynamos and every other kind of modern equipment. The plant at present is believed worth fully $100,000.

It does strictly job business, plating silverware, jewelry, automobile parts, and in fact everything that comes its way.

Another phase of the plating business ran parallel with the Bromley Electro Plate Works for a number of years.

The story is told that after Mr. Bromley had operated his place for a few years, a firm known as Galvin Brothers opened a similar establishment in the early eighties, before the electro plating patents had run out. These men balked at paying the royalty demanded, it is said, and finally were sued. The case was fought through the courts for some time. Galvin Brothers won, and from that time on no more royalties were paid.



HENRY FORD, THE DETROIT AUTOMOBILE KING, IN HIS FIRST GASOLINE AUTOMOBILE IN 1898. THESE WERE THE FIRST AUTOMOBILE PARTS PLATED IN DETROIT.

MANUFACTURING PLANTS INSTALL PLATING DEPARTMENTS.

While the Bromley Electro Plate Works is the oldest job establishment of the kind in the city, the Detroit Stove Works is declared to be the first manufacturing concern to do its own plating, and it was due to this concern that Mr. Bromley came to Detroit. This stove company was a comparatively small concern in the early days of industrial Detroit. The company is reported to have first manufactured stoves with comparatively no

National Officers of The American Electro-Platers' Society—1917-1918

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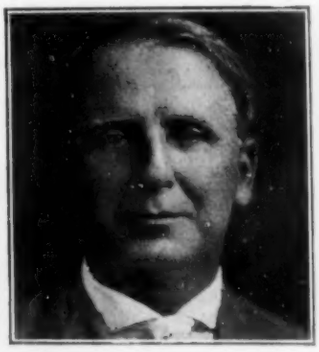

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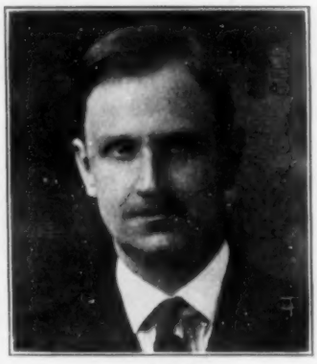

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trimmings until sometimes in the early seventies, when it began putting out more attractive designs, with polished and plated parts.

This company for years has been occupying an enormous plant at 1320-1380 Jefferson avenue, and is said to have one of the most complete plating and polishing plants in the city, of which Charles Sequin is foreman plater. It was incorporated in 1866 and its capital stock now is $3,500,000, of which $1,500,000 is preferred stock and $2,000,000 common stock. The officers are W. T. Barbour, president; W. G. Henry, vice-president; John

H. H. Williams, Assistant Editor

A. Partensky, Sergeant-at-Arms.

D. Green, secretary, and Frank G. Welbon and William H. Harley, assistant secretaries.

The Michigan Stove Works is another of the large manufacturing concerns here which also maintains a finely equipped plating and polishing establishment, with Wesley L. Berger in charge. It was incorporated in 1871 and now has a capital stock of $3,000,000. Jeremiah Dwyer is president; George H. Barbour, first vice-president; Charles A. Ducharme and H. B. Gillespie, second vice-presidents; Francis Palms, secretary; Edwin S. Barbour, treasurer, with Louis B. Young, general manager.

BARNEY NEHLS.

Another large concern is the Peninsular Stove Company at Fort and Eighth streets. It was incorporated in 1891 and reincorporated in 1903 for $3,000,000. F. T. Moran is president; J. M. Dwyer, vice-president; Daniel T. Crawley, secretary, and E. W. Dwyer, treasurer, with A. E. Dwyer, purchasing agent. This company also is reported to have a good sized plating plant, and J. O'Donnell is the foreman plater.

The Art Stove Co. has built up a good sized business during the last few years. It has for a number of years occupied a finely equipped plant at 1530 and 1549 and 1563 Russell street. Its incorporation dates back in 1888 with a capital stock of $500,000. William A. Dwyer is president; John O. Campbell, vice-president and general manager; Harry C. Kendall, treasurer, and Hugh Ledyard, secretary.

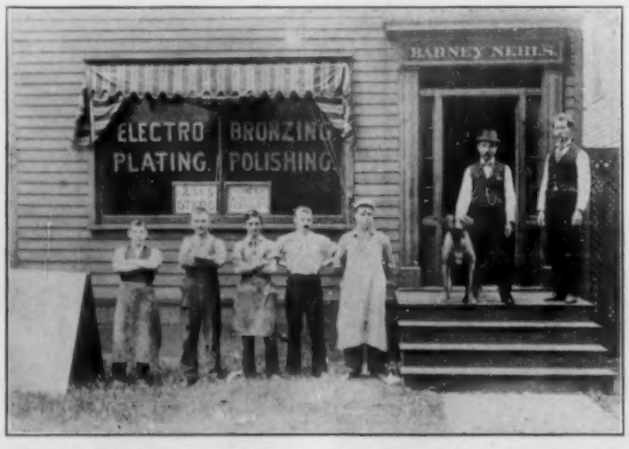
It will be seen by comparing officers all these concerns are closely related, but are operated strictly as separate corporations.

Detroit for many years has taken great pride in its stove manufacturing plants, nine companies, both large and small, being engaged in business here at present. The men at their head are most decidedly leaders in Detroit's business and financial life. The names of Barbour, Dwyer and Ducharme stand for honor, integrity and financial stability.

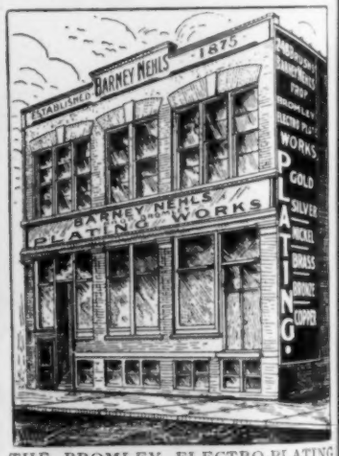
COMING OF THE BRASS MILLS.

The copper and brass business is said to date back to about 1881, at the time of the incorporation of the Detroit Copper and Brass Rolling Mills. Christian Buhl, Oliver Goldsmith and R. W. Gillett were promoters of this big corporation. The business was small at first, but it grew from year to year, until at present it is one of the largest of the kind in the United States.

The plant stands on Clark street near Fort street, and for years has undergone improvements until its equipment now represents millions of dollars. This company was the first in Detroit to manufacture brass and copper into sheets, rods, wire and tubes. Ore is obtained from the Lake Superior region, and in the states farther west. In the early days the plant gave employment to about 100 men and was in a small building on West Larned street. At first it made a specialty of sheet brass. Then the demand for manufactured brass products became greater and the management decided to produce wire and brazing tubing. This was late in 1902. In 1907 one of the most complete copper wire mills in the country was established. The history of this plant is practically the early history of the brass and copper business in Detroit, because it continually has advanced with the times.



THE FIRST JOB-PLATING SHOP IN DETROIT, THE BROMLEY ELECTRO-PLATING WORKS ESTABLISHED IN 1875.



THE BROMLEY ELECTRO-PLATING WORKS AS IT IS TODAY, OWNED BY BARNEY NEHLS.

The Michigan Copper and Brass Co. was organized in 1906, and its mill started in 1907. This company also produces sheet, rod and tubing, and has developed into one of Detroit's great producing concerns.

The Clayton & Lambert Company, manufacturers of plumbers' torches, is another pioneer plant. It began

operating in the early eighties. The Penberthy Injector Company, one of the largest of the kind in the country, also is listed as a pioneer. Numerous smaller companies and larger ones were organized at different times, from early in the eighties until the advent of the automobile industry.

THE COMING OF THE AUTOMOBILE ADDS TO DETROIT'S GROWING INDUSTRIES.

Closely linked with Detroit's copper, brass and plating business is the automobile. While the stove plants and the copper, brass and aluminum plants were great factors in building up the city's manufacturing supremacy, it is the automobile that has increased its population from 200,000 to approximately 900,000, in a little more than ten years.

Barney Nehls, owner of the Bromley Electro Plate Works, at 248 Brush street, without doubt plated the first automobile part in Detroit. He tells the story in the following language:

"One afternoon about 1898, I was in the back of my plant when one of my assistants came through the works and said a young fellow was in the office with some sort of a thing he was making for a horseless car. The clerk said the man wanted the part plated, estimated it would cost about five dollars and said the customer wanted 30 days' credit. He said the man was an inventor and thought we might be taking some chance. I had had experience with inventors before and also was not over enthusiastic about granting credit to such persons. So I walked over to a place I had where I could peek in and there saw the customer. He had a mighty good face and I decided at once to take the chance on the five dollar account. I told the clerk to take the order.

"We plated the part in due time and our customer came and took it away. He seemed pleased and promptly at the end of 30 days we got our money. That made the fellow's credit good, and from that time on I have done more or less work for him. The young man who stood in my office asking to open up a five dollar account was Henry Ford.

"I have never told this story before," said Mr. Nehls, "but believe it goes well to show the connecting link between the automobile industry and the plating and polishing business here."

Many other stories are told in Detroit regarding Mr. Ford's early experiences, but this one seems very apt at this time.

The Ford Motor Company today occupies one of the greatest manufacturing plants in the United States. It is capitalized for $100,000,000. Henry Ford is president; F. L. Klingensmith, vice-president and treasurer, while Edsel Ford, only son of Henry Ford, is secretary. Employment is given to about 40,000 men who, at present, are engaged heavily on government work. Airplane motors and the Liberty motor also are manufactured here, and now Mr. Ford has begun the production of submarine chasers, which will be manufactured to a greater extent at a new plant now being erected on the River Rouge in the western part of the city and only a short distance from the Detroit River. The Ford Motor Company is said to have one of the finest plating and polishing plants in the country. Every device possible is used to facilitate production. H. S. Brodway is foreman plater here.

THE PLANT OF THE MICHIGAN STOVE COMPANY AT DETROIT, MICH., THE FIRST TO HAVE A PLATING SHOP.

The Ford Motor Company and the Cadillac Motor Car Company, the latter owned by the General Motors Corporation, together with the Olds Motor Company of Lansing, Mich., for it was in Detroit the Olds company began first to manufacture cars, and the Packard Motor Car Co. are the pioneers of Detroit's early automobile days. Their success induced many persons to form automobile companies. Some have succeeded and some have failed. A. R. Hollway has charge of the plating depart-

ment and E. H. Woodmansee of the polishing department of the Cadillac Motor Car Company.

The Packard plant, which employs about 20,000 men and women, has wonderful plating and polishing departments in charge of M. Osery, and at present is manufacturing great numbers of trucks for the government. Among the later concerns are noted the Hudson Motor Car Company, the Paige Motor Car Company, the Studebaker Corporation and the Maxwell Motor Car Company, which also now manufactures the Chalmers cars. Later the General Motors Corporation was formed and took over the Cadillac Motor Car Company, the Buick Motor Car Company at Flint, Mich., the companies at Pontiac, Mich., and a number of others, although the old corporate names are retained.

The demand for cars and trucks became so great that plants which opened in 1899 and up until 1902, were unable to manufacture parts fast enough to keep up production, and attention was turned to the brass companies. The large and small ones alike were given contracts which soon swelled their bank accounts and also compelled a great many to build new plants and additions. Thus we have the automobile linked with the brass and copper industry. Many automobile parts also soon were plated, and this made work for the platers and the polishers, until at present the automobile manufacturer, the platers and the brass men are closely allied. All have been instrumental in making Detroit one of the great manufacturing cities in the country.

European war started in the summer of 1914. England, France and the other allied countries needed munitions, and Detroit again made another jump in manufacturing. Great quantities of shells, automobile trucks and other war material began to be turned out here. It was the brass men and the automobile men who did all this.

When the United States stepped in early in 1917, Detroit at once became one of the greatest producers of munitions and automobile trucks and other war material in the country. Shell companies were organized, and many automobile and brass concerns obtained war contracts, which early in 1918 represented more than $500,000,000.

The winter of 1917 was quiet for a time in many plants, and to some extent in the automobile factories, but when the spring of 1918 opened, government contracts flooded the city with work. The automobile companies curtailed production and rushed into munition work. Henry Ford went after the airplane motors, the Liberty Motor Company was organized by the Lelands, formerly of the Cadillac Motor Car Company, and are now rushing the erection of one of the greatest plants in the city.

LOOKING OVER GRAND CIRCUS PARK IN DETROIT, MICH.
HOTEL STATLER, WHERE THE ELECTRO-PLATERS' CONVENTION WILL BE HELD, IS THE BUILDING IN THE CENTER.

Practically all the big automobile factories are engaged on government work. Day and night the machinery is never stilled and plant managers are bending every effort to meet the heavy production demanded. This also extends to the shipbuilding plants here as well. They also are working under pressure in the construction of ocean-going boats to take the places of those destroyed by the enemy. These companies use vast quantities of brass, copper and aluminum, and also have plating plants of their own.

Labor is scarce in Detroit today and manufacturers are

doing everything possible to obtain sufficient help to keep up production. The city already has sent 50,000 men into the army and many more are going. Large numbers were skilled mechanics. So acute have become conditions that manufacturers have found it necessary to train women to take the places of men. Thousands of women are now employed, and their work is proving successful. They made good from the start, and are found in most instances even more careful than the men.

About 30 companies are now assembling automobiles here, many large and many small. Approximately 120 companies are engaged in the manufacture of parts, this number also including body and tire companies. Also about 40 companies are engaged in the production of copper, brass, bronze and aluminum products. Thirty companies are reported engaged exclusively in producing brass products.

The airplane was the next to follow. Detroit already is jumping into this new enterprise. The Liberty Motor Company has been formed within the past year and has underway a great structure at West Warren avenue near 31st street. Henry Ford also has taken up the business and is building a new plant exclusively for this branch, in the rear of his present factory in Highland Park. What the future will be remains to be seen, but Detroiters have no doubt that the airplane in a few years will be as serviceable for general travel as the automobile. The manufacture of planes will also be as closely allied with the brass, copper and plating business as the automobile. All this should be viewed with satisfaction.

It is almost impossible to obtain a complete list of the many plating plants and stove companies in the city. However, a number of those best known in addition to those mentioned are here given:

STOVE PLANTS

Alcohol Gas Stove Manufacturing Company, Russell street and Milwaukee avenue.
Best Stove Company, 39 Atwater street.
William Campbell Company, 160 Addison street.
Cosmic Products Company, 615 Equity building.
Detroit Vapor Stove Company, Kercheval avenue.
Gas Oil Stove Company, 12th street and the railroad.
Little Wonder Stove Company, 125 Cass avenue.
Rathbone Sard & Company, 22 Atwater street.
Regent Stove Company, Wyandotte, Mich.

PLATING PLANTS

Acme Plating & Specialty Manufacturing Company, 45 Fort street.
American Plating Works, 25 Griswold street.
John L. Buchner, 7-9 Jefferson avenue.
Enterprise Electro Plating & Manufacturing Company, 90 Woodbridge street.
Grant Silver Plating Company, 97 Congress street.
Howard G. Harris Company, 93 Catherine street.
Harry Brothers' Manufacturing Company, 282 Woodbridge street.
Halmich Manufacturing Company, 66 Fort street.
Michigan Electro Plating Company, 110 St. Antoine street.
Rex Plating Works, 310 Grand River avenue.
Standard Plating Company, 753 Beaubien street.
Welded Steel Barrel Corporation, Hart and Charlevoix streets.
Detroit Hardware Specialty Company, 66 Fort street.
Central Plating Company, 76 State street.
Detroit Utilities Supplies, 308 Ford building.
Standart Brothers, 166 Woodbridge street.
American Electric Heater Company, Woodward avenue.
E. J. Woodison Company, 53 Buhl Block.
Frederic B. Stevens, Larned and Third streets, dealers in platers' supplies.

OTHER MANUFACTURING CONCERNS

Edmunds & Jones Corporation, auto lamp makers; E. G. Lovering, foreman plater.
C. M. Hall Lamp Company; F. C. Harig, foreman plater.
Burroughs Adding Machine Company, James A. Burt.

AMERICAN ELECTRO PLATERS' SOCIETY

The American Electro Platers' Society opens its annual convention here July 1, and continues until July 3. The program is excellent, and as a feature, the committee in charge is making special arrangements for entertaining the wives of visiting delegates in a social as well as an educational way. It is determined to show these women the necessity of impressing upon their husbands the value of organization. Members of the committee believe that after the convention is over the women will be so enthused with the American Electro Platers' Society that they will compel their husbands never to lose interest in its affairs or to miss a meeting. The programme which has been prepared is as follows:

PROGRAM.

This program will be strictly followed and all events will start promptly on time as scheduled. Ladies' special program on another page.

EXHIBITION HALL WILL BE OPEN DAILY FROM 8 A. M. UNTIL CLOSE OF EVENING SESSION.

Monday, July First.

8.00 A. M.—Assembling of delegates and visitors at Hotel Statler. Registration and distribution of badges, credentials and tickets. Please be careful of tickets and auto numbers, as these are very essential to our entertaining you without unnecessary delay or confusion.

9.00 A. M.—Meeting of Executive Board and Credential Committee in Parlor A on Convention Floor.

10.00 A. M.—Opening session of the Sixth Annual Convention. Address of welcome by Oscar B. Marx, Mayor of Detroit. Response by Vice-president George B. Hogaboom, of New Britain, Conn. Report of officers and committees.

12.00 M.—Official photograph of delegates and visitors in parkway on east side of hotel. Don't forget to look pretty and smile.

1.30 P. M.—Leave hotel for visit to plating plants of Detroit. Use your auto number for this trip.

4.30 P. M.—Start for Belle Isle in autos.

5.30 P. M.—Buffet lunch on Belle Isle in grove east of Athletic Field. Given by Detroit Branch.

7.00 P. M.—Leave Belle Isle for Hotel Statler. Kindly use same auto number as before and it will avoid confusion.

8.00 P. M.—Business Session. Hotel Statler. Three papers will be read and discussed. These business sessions will be of a highly educational value and all should consider it a great privilege to attend every one.

Tuesday, July Second.

8.30 A. M.—Steamer *Sapho* leaves foot Bates street at 8.30 sharp for an all-day cruise on the Detroit River and Lake St. Clair, with a visit to St. Clair Flats, the "Venice of America." Boat is for use of convention exclusively. Compliments of the J. B. Ford Company, Wyandotte, Mich. Use your tickets.

9.30 A. M.—Business Session on lower deck. Three papers will be read and discussed. Dancing and entertainment on upper decks.

12.00 M.—Dinner will be served on all decks. Compliments of Detroit Branch.

2.00 P. M.—Business Session on lower deck. Three papers will be read and discussed. Dancing and entertainment on upper decks.

6.00 P. M.—Boat docks at foot Bates street.

8.00 P. M.—Business Session. Hotel Statler. Three papers will be read and discussed.

Wednesday, July Third.

8.30 A. M.—Business Session. Hotel Statler. Revision of Constitution. Election of officers. Selection of 1919 convention city. Final business session.

2.00 P. M.—Auto sight-seeing trip around Detroit's parks and boulevards. Each person will have a number to signify your machine, and if you are on hand

promptly at the north side of the hotel, Bagley avenue, it will aid the committee very materially. Thank you.

7.00 P. M.—Annual banquet at Hotel Statler. Use your tickets. Installation of officers. Good entertainment. Speeches that will interest you. Do not fail to attend, as Detroit Branch wants to show you they were on the job until the last minute. Good-bye. Glad to have had you with us. Drop in whenever you can. You are always welcome.

LADIES' PROGRAM.

Monday, July First.

The ladies of Detroit Branch have arranged this program for your entertainment and we are very very positive that you will enjoy every minute if you will allow them to carry it through on schedule. Please be on hand promptly at place designated.

8.00 A. M.—Assembling on convention floor. Everybody get acquainted.

9.00 A. M.—Shopping tour. Meet in Parlor C on convention floor.

12.00 M.—Official photograph of the delegates and visitors. Meet on east side of hotel on the parkway of Washington Boulevard.

12.30 P. M.—Lunch for the ladies at Newcombe Endicotte Company. Compliments of Detroit Branch.

2.00 P. M.—Auto ride. Assemble on the Bagley avenue side of the Hotel Statler. You will have a number to signify which machine will take you. Route: Out Woodward to Seven Mile Road. Turn east to Grosse Pointe Farms. West on Jefferson avenue to East Grand Boulevard. Across bridge to Belle Isle. Around Belle Isle to grove east of Athletic Field.

5.30 P. M.—Buffet lunch in same grove. Compliments of Detroit Branch.

7.00 P. M.—Leave island for Hotel Statler.

7.30 P. M.—Individual entertainment by ladies of the Detroit Branch. Tell the committee what you wish to do and they will do the necessary to make it an enjoyable evening. Good-night. See you in the morning.

Tuesday, July Second.

8.30 A. M.—Steamer *Sapho* leaves foot Bates street for all-day ride on Detroit River and Lake St. Clair, including a visit to St. Clair Flats, the "Venice of America." Use your tickets. Dancing and entertainment on upper deck of steamer all day. We would ask that you insist that the men attend the business sessions on the lower deck morning and afternoon. Aside from that let entertainment be undisturbed.

12.00 M.—Lunch will be served on upper and lower decks.

6.00 P. M.—Boat arrives at foot Bates street.

7.30 P. M.—Theatre party as guests of the Detroit Branch. Assemble in Parlor A of the Hotel Statler. Good-night. See you in the morning.

Wednesday, July Third.

9.00 A. M.—Trip to the Art Museum. Assemble in Parlor A of the hotel. Use your auto number.

2.00 P. M.—Auto trip around Detroit parks and boulevards. Assemble on the Bagley avenue side of the Hotel Statler. Each person will have a number to signify your machine, and if you will be on hand promptly it will help the committee wonderfully. Thanks.

7.00 P. M.—Annual banquet of the society. Do not fail to attend, as many things have been provided for your entertainment in the way of speeches and amusement.

Good-bye, ladies. We trust you have enjoyed yourselves and don't forget to drop in any time. We will all be glad to see you.

The ballroom floor of the Hotel Statler will be the headquarters of the convention. Upon this floor is located the banquet room, exhibition hall, ladies' parlors, reception rooms, check rooms, etc. There will be at all times at the information desk on this floor a member of Detroit Branch who will gladly furnish you with any information that may be desired.

The registration fee of $3.50 ($5.50 per couple) includes auto rides, lunches, theatre parties, boat ride, banquet, etc., as scheduled on the program. Extra banquet tickets (for those who do not register) will be $2 per plate.

When you register you will receive a badge, the pendant of which will serve as a watch fob if you so desire. Extra badges will be sold to those wishing them at cost. You will also receive an envelope containing tickets for the boat ride, lunches, etc., and we ask that you (both ladies and gentlemen) use these as instructed for the different events. For the auto rides your ticket will inform you the number of the machine in which you are to ride. Your co-operation in this will be mutually appreciated.

Detroit is at your service from the Mayor down to the newsboys and Detroit branch will be on the job every minute to serve you in every way possible. Michigan is a dry state and that fact will help us to make this convention the best ever. As our aim is to help you educationally and entertain you with wholesome amusement.

Detroit will serve you right.

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BRONZING BRASS.

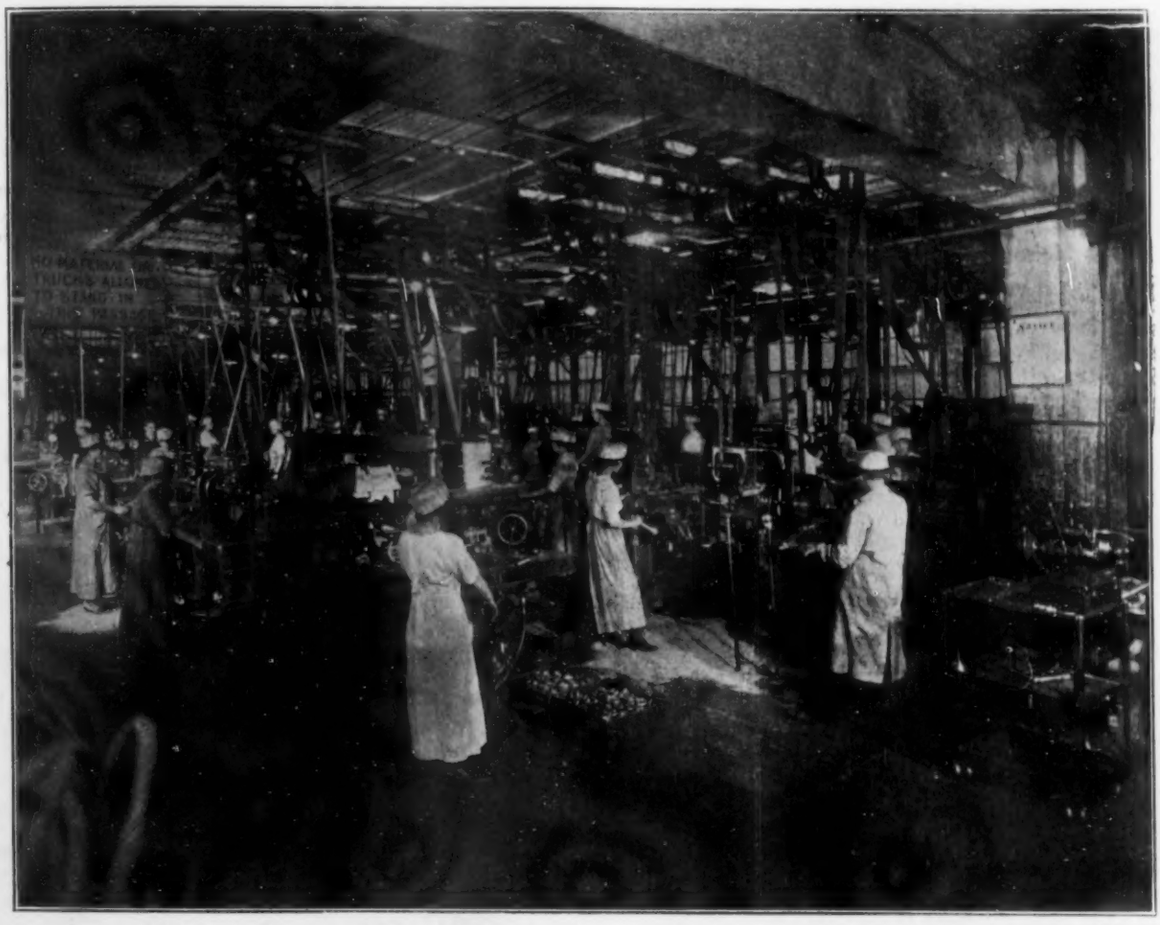
The following recipe is for producing a dark bronze coloration on bright brass: A mixture of nitric acid, sulphuric acid and water in equal parts is prepared by mixing the nitric acid and water first, and then slowly adding the sulphuric acid. The brass articles are dipped for a moment into boiling water, then into the acid solution, and into the boiling water again, quickly, after which they are washed thoroughly in cold water and dried with sawdust. They should be free from any soldered joints, as they would show up as light patches. The coloration can be made permanent by coating with a transparent lacquer.—Zeitschrift für Feinmechanik.

AN OLD PATENT COVERING THE RUST PROOFING OF IRON AND STEEL.

A Comparison of the Methods of Yesterday and Today.

written for The Metal Industry by Charles H. Proctor.

At the recent conference held at Washington, D. C. by the military authorities, the Bureau of Standards and members of the American Electro-Platers' Society, the most efficient methods were discussed for the prevention of corrosion on iron and steel parts. It was the consensus of opinion of those present that the metal zinc gave the most efficient protection for iron and steel. While no special formulaes were outlined still, from experiments that have been made with the sulphate and alkaline solutions, the bending test as applied to samples coated by means of these solutions have proven that the deposit from the alkaline solution withstands the test to a greater degree than the deposit from the acid solution. There is also no doubt but that a deposit produced by the alkaline solution is freer from the occlusion of hydrogen than that produced by the acid solution.



WOMEN IN THE WAR. WORKERS MACHINING SMALL PARTS AT THE PACKARD MOTOR CAR COMPANY, DETROIT, MICH.

Many other methods were discussed for the protection of iron and steel, among which was the phosphorizing process which is more commonly known under the name of the Parker Rust Proof Process. Although the so called Parker process has been officially recognized by the naval authorities in some of their specifications for finished products, the coating of phosphate of iron or manganese does not prove a rust proof coating unless protected by a secondary application of any oil high in carbon or linseed or paraffin oil. One of the most prominent rubber tire firms in Akron, Ohio, made exhaustive tests with the phosphorizing method only to find that the tire rims so coated rusted very rapidly unless they were protected with heavy oils, so the auto rim manufacturers still maintain the electro-galvanizing methods as the most efficient protection against corrosion. In many plants the zinc cyanide solution has replaced the acid solution due to the greater ductility and more even distribution of the zinc deposit over the surface of the rims.

The zinc cyanide or alkaline solutions are now used extensively in the zinc plating of ordnance parts such as detonators, adaptors, fuse parts and a hundred other articles of a like nature. The reason is obvious, as a uniform coating of zinc over the entire surface, without any detriment to threads, etc., is obtained. These solutions have been in operation since the war started and have been used on contract work for foreign governments and more lately on war material used by the United States government.

The Parker process has been employed to a great extent for the protection of metals against corrosion or where a black finish is desired as the method gives a

very pleasing black finish to steel or iron products when uniformly coated and finally coated with one of the oils mentioned above.

There are a number of patents that cover the phosphorizing of iron and steel, the most prominent being the Coslett and the Richards patents, both of which have been absorbed by the Parker Rust Proof Company, as the Coslett patent was no doubt used as the basic patent for the Parker process.

A method in vogue at a number of the large automobile body concerns consists of the use of a combination of phosphoric acid and denatured alcohol, the proportions of which are 1 part of phosphoric acid, 86 per cent, and 2 parts of denatured alcohol. After the steel parts are immersed in this solution they are allowed to dry atmospherically, which leaves a thin coating of phosphate of iron upon the surface of the steel when dry. This method has proven very successful where paints or enamels are afterwards applied to the surface. An addition of ¼ volume of carbon tetrachloride to the mixture makes the solution non-inflammable.

It was definitely decided during the conference held at Washington that where enamels or japans have to be applied to the steel to produce a black finish that a zinc coating previous to japanning or enameling was the most suitable method, especially if the japans and enamels were dried at a minimum temperature of 180 to 200 degrees Fahr.

About a year ago, when the writer was making some investigations relative to the methods of protecting iron and steel from corrosion I ran across an old patent that was issued in 1864. This patent covers many methods of preserving iron and steel from corrosion and will no doubt be of interest to the readers of THE METAL INDUSTRY. The patent reads as follows:

CHARLES DE BUSSY, OF PARIS, FRANCE, ASSIGNOR TO MORITZ PINNER, OF NEW YORK CITY, N. Y.

IMPROVEMENT IN PRESERVING IRON FROM CORROSION.

(Specification forming part of Letters Patent No. 43,630, dated July 19, 1864.)

To all whom it may concern:

Be it known that I, Charles de Bussy, of Paris, in the Empire of France, have invented an Improved Process for Preserving Iron from Corrosion, etc.; and I do hereby declare the nature of the said invention for an improved process for preserving iron from corrosion as produced by the influence of air and sea-water to be as follows:

The means hitherto employed for preserving iron from any corrosive actions are based either on galvanic processes or on the use of coatings intended to resist said corrosive actions. When substances are thus applied in a mechanical way to preserve the surface of iron they offer a very slight adhesion. Moreover, in many cases, according to the nature of the metallic oxide used for the coating, they will exert a direct corrosive action, such as takes place with minimum when applied to the hulls of iron-built vessels. Acting upon these data, I have come to the conclusion that in order to obtain a most satisfactory result in preserving iron a coating must be used whose adhesion shall be the result of a chemical action on the metal itself. Among the various matters that will fulfill this condition, I prefer using the fusible and insoluble ferruginous compounds, they both protecting the surface of the iron and filling up, by reason of their fusibility, those imperceptible fissures and cavities which always occur in wrought-iron, owing to the porous nature of the metal, and to the imperfections unavoidably arising from the forging or rolling process.

A great number of compounds may be used, each answering the purpose of this invention, as above set forth. In order to show clearly its nature, and how it is or may be carried into effect, I will now describe the manner in which I employ one particular compound by which I have obtained the best result.

The process which I consider the most simple and reliable consists in subjecting the iron pieces to be preserved to the action of phosphorus at a high temperature, so as to produce on their surface a thin layer or coating of melted phosphide of iron. This coating proves to be very adhesive, and is hardly acted upon by the corrosive agents to which iron is commonly exposed. This operation may be effected by exposing the red-hot iron direct to the vapors of phosphorus; but a more simple and economical way is by heating the pieces in cases or chambers similar to those of converting-furnaces, the pieces being embedded therein in a brasque or mixture composed of charcoal or coke dust impregnated with a solution of acid phosphate of lime. Pieces of large size may also be brought to a welding-heat and then be laid on a bed or brasque composed as aforesaid and well dried and covered up with the same materials. The heat radiated by the piece is sufficiently powerful to cause the distillation of the phosphorus and its combination with the iron.

This process may be advantageously applied in many instances, such as for iron plates to be used in ship and house building, anchors, gun-carriages, water-tanks, etc. It is peculiarly adapted for iron plating or iron shields or armors, for preventing the rapid deterioration of which no efficient means have been devised hitherto.

I wish it to be distinctly understood that I do not confine my process to the use of phosphorus only, as I may use in its stead any other body acting in the same way, such as arsenic, antimony, etc. The mode of applying these various substances will necessarily have to be somewhat modified, according to their reactions and the nature of the compounds from which they are derived. Arsenic, for instance, will be applied in the same way as phosphorus, with the only difference that the brasque shall be composed of a mixture of charcoal and arsenious acid with lime, carbonate of lime, or an alkaline carbonate.

Having thus described my invention and the several modes in which I contemplate its application, I claim as my invention and desire to secure by Letters Patent of the United States—

The protecting of iron plates, beams, and other articles of iron used for ships, vessels, wharves, buildings, and other purposes by subjecting the same to a chemical process and covering them with a coating, so as to prevent corrosion and the other actions of water and air, substantially as herein described.

C. DE BUSSY.

Witnesses:
F. COLHAUSEN,
AMEIRÉ MAHIEUSE.

The writer has been informed that the Frankfort Arsenal in Philadelphia, Pa., has used for thirty years a method for producing a black finish on ordnance parts based upon a simple boiling solution of phosphoric acid and water, and there is no doubt but that the patent herewith given was used as a basis for their methods.

But until science has produced a more efficient anti-corrosive method than zinc deposits, the method of hot and electro-galvanizing will have to stand as the best method to protect iron and steel.

METAL SHORTAGE IN GERMANY.

There is rapid accumulation of evidence pointing to the shortage in Germany of those metals most needed for war purposes. This is proven by the drastic orders recently issued by the military authorities indicating a dire lack of metals, especially copper, zinc and aluminum.

The German military authorities have given notice to the civil population of an immediate inspection of household fittings in copper, copper alloy, nickel, aluminum and zinc. The order applies to doorknobs, metal sinks, window handles, gas brackets and many other kinds of household hardware. Up to now metal household fixtures, except large pieces, had not been subject to seizure by the military.

A still more drastic order relates to tin, specifying metal used in steam-heated houses, letter boxes, oil cans, candlesticks and shop window fittings. All supplies of manganese have been requisitioned. Nickel coins are being called in to make machine gun parts.

MECHANICAL TINNING OF METALS

A Description of a New Machine Designed to Take the Place of Hand Coating

By L. J. Krom.

The Metal Industry in March, 1913, published a description of the methods in use for the coating of sheet metals with tin on one side only. It was stated in the article that at that time there was no commercially successful machine in use or on the market for doing this work mechanically. As if in answer to the statement there appeared in September of the same year one Roberts who declared he had solved the problem. After some little time a machine after Mr. Roberts' designs was built and tested, but as far as we know did not prove a success and has disappeared from view.

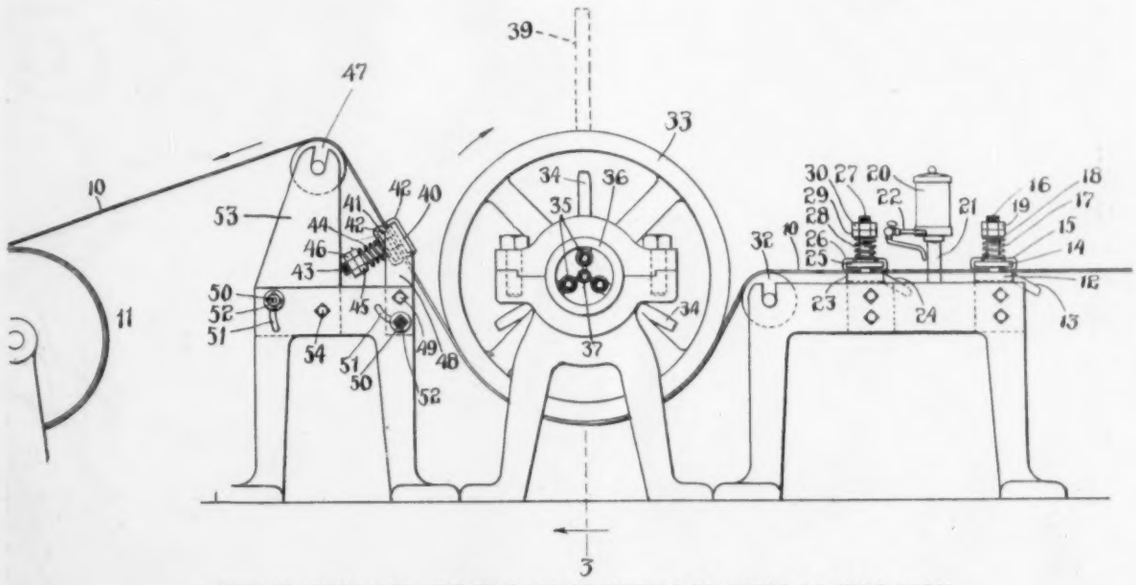
Just at this time, however, when tin is soaring up around a dollar or so per pound and the Government holding practically all available, there comes into view another tinning machine. Albert H. Wehrle, of Derby, Conn., has recently received letters patent for a tinning machine which appears to have unusual merit and which I hope will go a long way to eliminate the present wasteful way of tinning sheet metal on one side. The subject is such a vital one that a description of Mr. Wehrle's machine will prove of great interest to tin users. Patent No. 1,244,931 which has been assigned to W. A. Cook, of New York, contains the following:

In applying a coating of tin to sheet metal and wire, it has been the common practice heretofore to reduce solid tin to a molten state by heating it and to effect the transfer of molten tin from the receptacle in which the tin is melted to a roll or other device whereby the tin is applied to the sheet metal. This operation has involved considerable loss in the tin which is relatively expensive as more or less of the tin, when in a molten state, oxidizes and forms what is known as "dross."

The present invention is characterized by the fact that the tin for coating the metal is in the form of a solid block and this tin is reduced to a molten state as an incident of the operation of applying the tin to the metal and only as fast as the operation of applying the tin to the metal progresses. Preferably a rotatable cylinder is employed provided with means for heating the peripheral surface thereof to a relatively high temperature; a block of solid tin is held in contact with the surface of this cylinder so that the tin is melted by its contact with the cylinder and the cylinder takes up a thin film of molten tin from the block; and, the metal to be coated is carried into close contact with the cylinder at a point on the cylinder displaced by a short distance from the block of solid tin so that the metal takes up the film of molten tin from the surface of the cylinder.

With these and other objects in view there has been devised the novel metal coating machine which is here described and shown in the cut.

While the machine will be found especially valuable for tinning copper, it will be found equally useful for tinning sheets, strips or wire made of iron or steel. When



A NEW MACHINE FOR THE TINNING OF METALS IN SHEET OR WIRE FORM.

used for tinning sheets or short strips, the sheets may be joined by turning the edges and connecting them together by hooked joints so that they may be more readily handled by passing them through the machine as one continuous strip.

The metal, indicated by 10, which may be either sheet metal or wire, is drawn through the machine by means of a power-driven winding drum indicated by 11. The metal first passes through a tension device comprising a fixed plate 12 which is preferably provided with an inclined guide 13 on the receiving side, and a spring controlled plate 14, which is preferably wound with wicking, indicated by 15. Threaded rods 16 are rigidly secured in and extend upward from the ends of plate 12 and pass through holes in plate 14. Springs 17 surrounding the rods and bearing against plate 14 are set at the required tension by means of a nut 18 and locked there by a set nut 19. The metal then passes through a fluxing device which comprises a can 20 carried by a bracket 21 and provided with a jointed pipe 22 for delivering acid or other suitable fluxing liquid which is deposited upon a spreader constructed similarly to the tension device. 23 denotes the fixed plate of the spreader which is preferably provided with an inclined guide 24, 25 the spring

controller plate, 26 wicking, 27 the threaded rods, 28 the springs, 29 the nut and 30 the set nut, the only difference in construction between the spreader and the tension device being that the spring controlled plate of the spreader is provided with a longitudinal slot 31, through which the fluxing fluid passes freely so as to completely saturate the wicking and spread the fluxing material evenly upon the surface of the metal to be tinned. The metal then passes over a roller 32 and partly about a heated tinning drum 33 which is driven at substantially the same surface speed as the winding drum. I have shown the drum as heated by means of three sets of burners indicated by 34 which project radially from gas pipes 35 which extend into the drum through a hollow journal 36. 37 denotes an air supply pipe lying between the gas pipes. From

WOMEN WORKERS OF THE PACKARD MOTOR CAR COMPANY, DETROIT, MICH., IN WAR GARB TO HELP UNCLE SAM WIN THE WAR.

pips 37, air pipes 38 extend into and partly through each burner so that the burners are caused to operate on the Bunsen principle and intensely hot flames are produced which heat the drum to any required temperature. It will be noted that the drum is made relatively heavy so as to retain the heat. A block of tin in the form of the solid metal is held against the peripheral surface of the drum 33 by hand or by any suitable mechanical devices so that as the heated drum is rotated it melts the portion of the block of tin in contact with the drum and takes up therefrom a thin film of tin in a molten state. This thin film is carried around to the point where the sheet to be coated makes contact with the drum and is there applied to the sheet. The metal to be tinned is shown as passing over the under side of the drum and there is indicated at 39 a block of tin which may be held against the periphery of the drum by hand or may be pressed against it by any suitable automatic device not shown. The heat of the drum melts the tin and causes the surface of the drum to be covered evenly with a very thin film of molten tin which is applied to the metal as it passes over the drum, as will be readily understood from the photograph.

After leaving the drum, the tinned metal passes through a wiper which is similar in construction to the tension device and the fluxing device and comprises a fixed plate 40, a spring controlled plate 41, both of which plates in the present instance are wound with wicking 42, threaded rods 43 rigidly secured to the fixed plate and passing through holes in the spring controlled plate, springs 44 and a nut 45 and set nut 46 for regulating the tension of the springs. After leaving the wiper the metal passes over a roller 47 and thence to the winding drum. In order that the amount of contact of the metal being coated with the heated drum may be increased or decreased, if required, the standard 48 is pivoted by which the wiper is carried, as at 49, and the standard is provided with a threaded stud 50 which extends through a slot 51 in the frame and lock the wiper at any required adjustment by means of a nut 52 engaging the stud. The standard 53 which carries roller 47 is also pivoted as at 54 and is made adjustable in the same manner as the wiper standard.

When it is required to tin wire, the heated drum is provided with one or a plurality of grooves 55.

HOW TO CONSERVE SULPHURIC ACID AND WHY

SOME SUGGESTIONS OF VALUE TO BOTH ELECTRO-PLATER AND METAL WORKER.

WRITTEN FOR THE METAL INDUSTRY BY H. J. BROUGHTON.*

Never before in the world's history has such a responsibility rested upon any one class of people as that which now rests upon the main factors in the industries that are using sulphuric acid. The man who is not awake to this fact is sleeping a dangerous sleep. Indeed there is no more effective form of patriotism than that which now will express itself in lending a hand to your Government in conserving the supply of sulphuric acid.

It is no longer a matter of what we can do, it is what we must do. The ideals of those who founded this Government demand every ounce of support that now can be given to their perpetuation and the consequent safeguarding of the future. And you must approach the task of the investigation of the sulphuric acid substitute, not as a new burden added to the many you already have to bear, but as a new and supreme opportunity to serve your country. It should be realized that this is a vital necessity. To do this is an act of patriotism in itself.

We might as well cease speculating on when the war will end. The thing for every man to do is to order his affairs in such a manner as to help the Government, thus bringing the war to a speedier close. Men, money and food they say will end the war, but what good will the money do if we are using up what the money is meant to buy?

We have accepted the successful substitutes for wheat and they are here to stay even after the war is over. So also have we seen substitutes for many other important items. Just so in nitre cake do we have a substitute for sulphuric acid. You buy Liberty Bonds, lending your money to the Government, what is one of the things it does with the money? It is used to buy sulphuric acid which makes the munitions and pickles the guns used in battle and made in Government controlled factories—they must have the acid—nor can it spend the money for the acid if it is not to be obtained.

Today the first requisite not only for our future success but for our present safety is increased production and conservation of our sulphuric acid supply. You who have contracts for your future supply of sulphuric acid, consider yourselves fortunate, for the time being you are getting it at a price which perhaps does not necessitate your looking for a substitute at once. What are you going to do when your contracts run out? You will no doubt pay the high price for acid used after your present contracts expire.

How many using the acid today, whose contracts at the old prices have run out, wish that they did not have to use it. No doubt if you had investigated a substitute you would still be making the profit you did while using the acid at the old price. You say you haven't time to investigate the properties of nitre cake-sulphuric acids substitute—very well, but you do have chemists, superintendents, pickle men who could investigate for you.

Your pickling problems are a vital part of your industry. You perhaps are supplying your Government with goods wherein the pickling process is an absolute necessity. The Government will not accept material that is not turned out according to specifications. What will be done when the Government commandeers the sulphuric acid supply? You that use the acid, have you stopped to think of that time that is coming? and it is not very far off. Just as surely as the Government took over the food supply and the transportation system, just as surely will it take control of the sulphuric acid supply.

More sulphuric acid is being produced than ever before—new sources of supply are being brought to light. But to make up for that the pyrites importations have been decreased, the supply of sulphur from Sicily has stopped. True the sulphur fields of Louisiana and Texas are producing more sulphur than ever before, but this does not begin to supply all the acid that is needed. If you will put yourselves in a condition of preparedness, get ready for the time when the supply of sulphuric acid to you will be stopped.

Technical men, metal workers, do you realize to what extent sulphuric acid is used in this country in times of peace? It is the basis of all chemical industry and used for making drug chemicals, technical chemicals, fertilizers dyes, lubrication oils, illuminating oils, fabrics, leather, artificial leathers, paints, lacquers, pigments, silk, greases, soaps, food cereals, sugars, syrups, battery solutions and in fact to enumerate all its uses would require a volume which would look like a chemical dictionary. It hardly seems possible that a product used in such immense quantities and so essential to the arts, trades and industries could be totally unfamiliar to the average man, but such is the case.

The United States at the outbreak of the European war had an annual output of sulphuric acid amounting to 4,057,947 tons. During 1916 the production was 5,475,000 tons—an increase of more than twenty-five per cent; the price per ton for much of this acid was quadrupled, and today the market price has raised to a point almost prohibitive for its use in many of the industries. It was to produce over 4,000,000 tons of the acid used in the industries in times of peace that our factories were working prior to 1914. Then came the war; and the world's resources of men, money and munitions were turned from constructive to destructive work.

The bare facts of the situation are sufficient to reveal its seriousness. Never in the history of the world have high explosives played such an important part and been used in such great quantities as in the present conflict. For over three years millions of tons of shells have been devastating cities, wiping out steel and concrete defenses and literally raining death upon blood-sodden battlefields. Without sulphuric acid our military explosives would be confined chiefly to black powder. What, then, would be the result of the war?

It is now time to see how you can further your own interests by being prepared for what is sure to come, and that is having the supply of sulphuric acid cut off from non-essential industries. For a long time we have been writing, reading and hearing such statements. All experts have held to such opinions. But not until now have we come to a place where a pressing need opens the door to a practical demonstration of these facts.

Our hats are off to the men in khaki who offer their lives to their country and march away to give their all for the sake of humanity, for the sake of their homes, for harmony and a continuation of life's peaceful pursuits. Is it asking too much of you to spend a little of your time or the time of your chemists, superintendents, laboratory workers or factory hands that know the facts of your business, to investigate sulphuric acid substitutes?

To produce explosive without limit is the task our Government has to perform. It is your duty to conserve and

*E. I. Du Pont De Nemours Company.

help supply it with the necessary ingredients that go into the manufacture of munitions. You cannot throw the burden upon others. Investigation to be of benefit to you must be carried on by you and your employees in your own works under conditions that exist there.

I can go on and tell you of the many advantages to be gained by using nitre cake in place of sulphuric acid, but unless you put it to a practical test in your own plant how are you going to prove my assertions? Many are giving hours of their own time and that of their employees to help raise Red Cross subscriptions and sell Liberty Bonds, all of which is a worthy and patriotic effort. Why not do the same with a few hours of your time on the work of investigation of the sulphuric acid substances? It's coming, this cut off in the supply of this essential acid, just as sure as fate, and the first thing you will know about it will be when the Government stops your supply, as it did with ammonia.

Most assuredly a demonstrator could call at your factory to show you and your men how to use nitre cake. You are perfectly willing to give all aid in the demonstration by supplying men, tubing, castings, forgings, cranes; in fact, everything to help with the work of demonstration, but why wait for him when you can carry on the work yourself? Is it possible that you cannot spare the time? Is your time more valuable than the lives of those who give their all? Would you be a slacker? That's an unpleasant thought, but it sometimes takes unpleasant thoughts and ugly sayings to bring some men to a realization of their duty. And the time to do your duty is now.

Do not cheat yourselves into thinking that you can wait to have done for you what you can do for yourself. Save sulphuric acid or sink later. Now is the time; do not put it off, for the idea of delay has wrecked many lives and many enterprises. Procrastination is the thief of time, and time is the cheapest, yet the most valuable thing we have. It is not necessary that you should wear khaki to help win this war. Co-operation will be a big factor in the winning, but the real fighter will be the co-operator that co-operates. It matters not what substitute you use for sulphuric acid, nor whose make, but use one of them.

Nitre cake has proven to be the most acceptable and is a product in the manufacture of nitric acid. It is a fused salt containing approximately 78% of sodium bisulphate, 20% normal sodium sulphate and a trace of ferrous sulphate, some silicious matter insoluble in water and a small amount of moisture. Its acidity is equivalent to 32% of sulphuric acid, and in all its reactions it may be looked upon as containing this amount of available acid.

Today nitre cake is the product of a chemically controlled operation and contains no nitric acid. The chief industrial use of nitre cake at the present time is in the pickling of iron and steel, copper and brass. Pickling refers to the process of removing oxide scale from the surface of metals, such scale having been formed during some heating or heating and rolling process.

Nitre cake has a distinct advantage over sulphuric acid for pickling purposes because it removes the scale efficiently without attacking the metal materially, hence it is becoming a big factor in many plants. It has as much, if not more, speed in pickling than the acid; it can be handled easily and does not burn the workmen like sulphuric acid; there are no carboys to be returned when it is used, and the cost of pickling per ton is materially reduced. It is a non-dangerous material and can be used in many instances where sulphuric acid cannot be used. It is readily soluble in hot water and yields when so dissolved a solution containing approximately 18% of sulphuric acid equivalent.

Following is a partial list of its many uses: for accelerating plaster, removing oxide and scale from sheet and tin plate, pressed steel hardware, munitions and ordnance, enameled and stamped ware, shells and cartridges, lenses, foundry castings, tubes, drop forgings, steel, tool steel, bolts, nuts, rivets, metals before galvanizing and plated ware.

Cutting up organic base goods and acidifying phosphate rock for fertilizers, converting foots into soap stock in refining vegetable and animal oils, recovering grease from wool scouring and finishing operations.

As an acid wash, defiberizing rubber scrap, as a conditioner by live stock food makers, cream of tartar substitutes by baking powder makers, in bleaching processes by paper pulp makers, preparing sulphates by heavy chemical makers, preparing muriatic acid, and for acidifying phenolates and naphtholates in die making.

As an acid grease wash by rendering works, grease recovery in sewage disposal, carbonizing and acid dye baths by textile mills, carbonizing by shoddy manufacturers, as flux by smelters and refiners, cyanide process, in flotation and leaching ores by miners of precious and high-grade metals, for pickling, and in the one-bath chrome process by tanners, in acid dye baths in (natural) silk mills, removing feces and used as a larvaecide.

The above are the chief uses for nitre cake and many other possible uses exist that are becoming known daily. A product that can be used in so many ways is worthy of your fullest investigation, and it will soon be necessary for you to know more of this subject of substitutes for sulphuric acid. In spite of the fact that every individual cannot be directly associated with Government activities or with great organizations, you can be a part of the machine which is to carry on the war. On your own initiative and without association with others you can give as much faithful service and as much assistance and bear as much responsibility as if you wore a uniform or received your orders directly from the Government.

The part which individual service accomplishes is difficult to understand unless considered in relation to the whole situation. Considered in this way it should be evident that effective service behind the lines consists in making the resources of the country available for war. Every effort therefore which serves to make them available—whether it is an effort to produce or conserve—is a direct contribution to winning the war. Vast as are the resources of this country, they are not unlimited. They cannot be made to do duty; they cannot supply the luxuries and comforts of living to which people are accustomed in times of peace and at the same time provide for the necessities of war.

Think, you men who are now using sulphuric acid, it is your duty to all that you hold dear in life to meet your own individual responsibility and to do all you can to help win this war, not only in turning out your product according to specifications but to turn it out with the least consumption of materials that play such an important role as sulphuric acid today. We may not be headed toward a sulphuric acid famine—for we are using every available means to produce more and more of the acid—but as the time approaches when we need more and still more munitions, something must be done to control the acid supply.

Fortify yourself for the time when the supply to you will be cut off, or prevent this radical measure being forced upon you by releasing part of the acid you are now consuming. This can best be done by using a substitute in at least some of your processes. American efficiency is undergoing its severest test. The time has come when American food, American metals and American munitions produced directly or indirectly by the aid of sulphuric acid must back up the American soldier in keeping the world safe for democracy.

A ROCKING ELECTRIC BRASS FURNACE*

A Description of a New Type for Metal Dedicated to the Public by the Inventors.

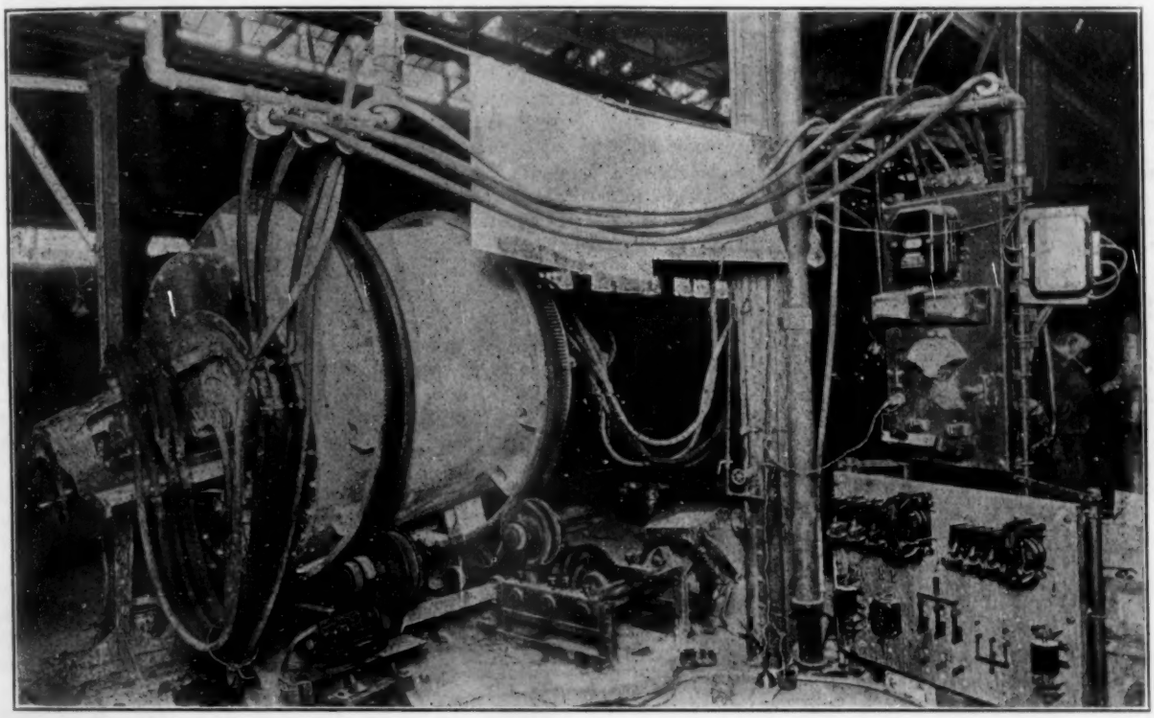
By H. W. Gillett and A. E. Rhoads

In its study of electric brass melting during the past five years, the Bureau of Mines has tried out a rocking type of furnace, which may perhaps help to fill this gap.

In the ordinary indirect arc type of furnace, the heat is applied above the melt and as hot metal is lighter than colder metal, there is little circulation in the bath. If the rate of heat input is at all rapid, as is necessary for thermal efficiency, heat conduction from the top of the melt downward does not keep pace with the heat supply. Before the melt as a whole reaches the proper pouring temperature, the surface is much superheated.

On an alloy high in zinc the surface will reach the boiling point of the zinc in that particular alloy while the bottom is scarcely melted. Such heating creates a high pressure of zinc vapor, within the furnace, so that if the furnace is not tightly closed, zinc is lost continually. If the furnace is sealed tight, the pressure may even blow out the roof or door. In case the furnace holds tight and the pressure is not relieved till the spout is opened for pouring, a long hissing stream of zinc vapor then shoots out, burning in the air. This local over-heating is the cause of the failure of the indirect arc furnace to handle alloys high in zinc without large metal losses.

The obvious way to overcome this trouble is to stir the melt so vigorously that the temperature of the melt is practically uniform and the superheating of the surface prevented. The most practical way to stir the melt is by the principle of the cement mixer, by turning the furnace bodily so as to stir the contents thoroughly while being heated. Constant rotation of a cylindical furnace placed more or less horizontally, but preferably at a slight angle with the horizontal to produce endwise motion of the melt during rotation, with electrodes entering at the ends of the drum and an arc struck between the electrodes should not only stir the charge thoroughly, avoid surface over-heating and thus prevent zinc losses, but should also give a well-mixed alloy. By washing the walls with metal the heat stored in the walls and roof should be largely taken up in the metal instead of passing out. The power consumption should therefore be low. As the walls are washed with metal their temperature can rise little above the temperature of the metal, which should give a good life of lining.



ROCKING ELECTRIC METAL MELTING FURNACE AT THE PLANT OF THE MICHIGAN SMELTING AND REFINING COMPANY, DETROIT, MICH.

Instead of rotating the furnace through a complete revolution which would involve difficulty in keeping the metal out of the joints between the door and the door opening, as this opening should be on the circumference of the drum rather than on the end—and in making brush contracts to the electrodes, it appears simpler to rock the furnace back and forth so that the molten charge just fails to reach the door at either end of its rocking angle.

A small furnace of this type was built and tried out. This was rocked back and forth by hand on tracks. (See plate XII Bull. 141.) It was cheaply constructed from materials at hand in the laboratory and was not expected to give very good results on power consumption, as the drum was too small to allow as thick refractory lining to be of desirable thickness.

The laboratory furnace held about 100 pounds of charge, and operated on 50 to 75 volts, 500 to 700

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amperes at a power factor of 85 to 90. The usual power input was about 30 K.W. Graphite electrodes 2" in diameter were used.

A number of different alloys were melted in the rocking furnace. In melting 1092.1 pounds of yellow brass, made up of 45% ingot, 55% copper and zinc, the calculated analysis being as 65.6% Cu. 34.4% Zn. 1080.4 pounds of ingot were obtained, analyzing 65.9% copper, 34.1% zinc. The metal loss by weight was 1.06% which includes both volatilization and mechanical loss by spatter in pouring. The average pouring temperature was 1080°C.

On manganese bronze chips (40% zinc) the furnace gave a net metal loss of 3.0% while the same lot of chips melted in oil-fired crucible furnaces in commercial practice gave 7.2% loss.

Yellow brass chips (25% zinc) gave 1.6% net loss, red brass chips (10% zinc) 1.0%.

A fine concentrate (20 mesh) from brass furnace ashes obtained in the manufacture of an alloy of 80% copper, 20% zinc brass, analyzed 71.0% and 14.3% zinc, the balance being ash, etc.; after melting in the furnace and 99% of the copper and 50% of the zinc in the concentrate recovered. This material is usually sent to the smelter and refined in a reverbatory furnace, not all of the copper and none of the zinc being recovered.

Yellow brass ingot (25% zinc) was remelted with 0.5% loss. Red brass (10% zinc) made up from red gates, scrap copper, yellow chips, lead and tin, was melted with 0.5% loss.

Heavy nickel alloy scrap (18% nickel, 56% copper, 26% zinc) which gave 1.8% loss on commercial melting in coke fires was melted with 1.2% loss.

Sound copper castings were made from metal melted in the furnace.

Red Brass of 81½% copper, 8½% zinc, 6% lead, 4% tin, made up from red and yellow ingot and scrap copper, was melted in one series of tests with the following results, the furnace being cold at the start.

TABLE 1.

Heat No.	Weight of charge pounds	Time arc was on mins.	Pouring temp. °C.	K. W. H. used	K. W. H. per 100 pounds
L 34	127.3	57	1140	40½	30½
L 35	127.75	50	1180	30½	25
L 36	128.5	50	1220	26½	20½
L 37	126.5	37	1220	22½	17¾
L 38	129.5	36	1220	19¾	14¾
	Ttl. 639.55	Av. 46	Av. 1200	Ttl. 138½	Av. 21¾

The total elapsed time for the five heats, including charging and pouring, was 5 hours. 630.9 pounds ingot were poured and 7.45 pounds metal from spillings, etc. was recovered, giving a gross metal loss of 1.35% and a net loss of 0.2%.

The power consumption, at the rate of 430 K.W.H. per ton on a five hour run, starting from the cold, and at the rate of 295 K.W.H. per ton when the furnace is hot, with the metal heated to 1200°C, is surprisingly low for so small a furnace.

The results above show that the rocking furnace is a type capable of giving low metal loss and low power consumption. When the furnace was not rocked while melting alloys high in zinc, pressure built up within the furnace and zinc losses were high.

The laboratory tests having demonstrated the probable usefulness of the type, a furnace of commercial size was designed.

The Detroit Edison Company had long been interested in electric brass furnaces as a possible outlet for electric power, and offered to co-operate by constructing a rocking furnace for commercial test without expense to the Bureau of Mines, except for the salaries and expenses of its representatives while supervising the test.

Sketches of the furnace design were given the Detroit Edison Company, which refined the design, made the working drawings, constructed and erected the furnace.

The furnace is shown in Fig. 1. The drum is 5 feet in diameter by 5 feet long. The lining is 12 inches thick, and consits of Silocel brick on the outside, special heat-insulating brick in the middle layer and corundite brick [a very refractory firebrick high in aluminum oxide (Al_2O_3)] in the actual hearth lining. The hearth is three feet long by three feet in diameter, taking charges of 1,300 lbs. and upwards. The electrodes are 4 inches diameter graphite, threaded for continuous feed, and are adjusted by screw-operated supports of the lathe-slide type. Single-phase, 60 cycle current, stepped down to 120 or 130 volts is used, 300 K. V. A. being available. Electrode adjustment is by hand, and, to stabilize the arc an external reactance is used which brings the power factor of furnace plus reactance, measured at the furnace switchboard, to about 85. The open circuit voltage falls to about 106 to 116 volts under load. The current varies between 1,000 and 2,000 amperes, 1,650 amperes being about the average. The power input can be varied by altering the length of the arc, and runs from 100 to 200 K. W. averaging about 165 K. W.

The flexible leads and the water hose for electrode cooling are given slack to allow rocking the furnace, as is clearly shown in the photograph.

The rocking of the furnace during melting is automatically done by means of the central device shown, with cover removed, in the lower left-hand corner. This can be set to give a "safe rock" of 80°, the limit of motion being such that the metal just does not run into the spout. After the charge has begun to melt, the "safe rock" is started. It is called the "safe" rock because the angle is such that solid charge will not fall on the electrodes and break them. A complete oscillation on safe rock takes 13½ seconds.

During the safe rock the solid metal is swashed about in the molten part of the charge and is tumbled over, so that fresh surfaces receive direct radiation from the arc.

As melting goes on, the rocking angle is increased by turning the handle of the control device from time to time, until, when the metal is all melted, the furnace is on the "full rock," of about 200°. On full rock the metal washes the whole circumference of the hearth save the height of the charging door and a few inches above and below it, so that metal does not splash into the door joint. A complete oscillation takes 33½ seconds.

The reversal of the 5 H. P. motor at either end of the rocking angle is done by contactors, operated by solenoids actuated by the contacts on the control device.

When it is desired to depress the spout past the limiting point of the automatic rock, for pouring, the control device is switched out and the solenoids operated by a reversing switch.

The furnace is installed at the plant of the Michigan Smelting and Refining Company, Detroit, Michigan, which makes brass ingot to customer's specifications from chips, scrap and junk of various kinds, by means of strict chemical control. As the firm makes no sand

castings, but ingot only, no observations on the comparative quality of metal melted in the electric furnace and in the coke fires were possible. All the metal melted was poured into ingot which went into the regular output of the plant. As far as could be told by analysis and appearance, the electrically-melted metal was of at least as good a quality as from the coke fires. On alloys high in lead there was somewhat less segregation than in the metal melted in crucibles, and on charges high in zinc, the zinc content of the metal from the electric furnace was higher than that from the same charges melted in the coke fires.

As there is generally much oil in the borings and some non-metallic material in the other scrap, the true metallic content of the charge is seldom accurately known. Hence the net metal losses cannot be exactly determined.

The metal losses were therefore compared with those of the coke-fired crucible furnaces operating on the same charge.

From 102 tons of metal melted in strict comparison with the crucible furnaces, the rocking electric furnace produced 3,626 lbs. more metal from the same charge than the coke fires, or 1.8%. The alloys melted ran from 90% to 66% copper, 1% to 9% tin, 1½% to 26½% lead, 0 to 30% zinc.

The comparative metal losses on a few alloys in the electric and the coke fires are given in Table 2.

TABLE 2.

Composition, per cent.				Weight Charged	Per cent. less (metal, oil and dirt) coke fires.	Per cent. less (metal, oil and dirt) electric.
Copper.	Tin.	Lead.	Zinc.	Lbs.		
85	5	5	5	6,576	4.6	3.2
84	7	8	1	11,600	7.0	3,7
84	6	10	0	14,300	2.4	1.8
79	9	10	2	11,790	3.6	2.1
78	2	10	10	15,840	7.1	3.1
76	8	13	3	11,805	4.0	2.4
73	4	20	3	14,392	3.7	2.9
67½	4	26½	2	5,224	3.0	2.4
67	1	2	30	7,200	8.0	5.1

The rocking furnace gave alloys analyzing very close to the calculated analysis, especially if the difficulty of calculating the analysis of a scrap charge is considered. Characteristic analyses are given in Table 3.

Table 3.

TABLE 3.

	Copper.	Tin.	Lead.	Zinc.
Sought	76	8	13	3
Electric	75.9	8.3	13.1	2.7
Sought	76	8	13	3
Electric	76.2	8	12.4	3.2
Sought	85	5	5	5
Electric	85.2	4.9	4.8	5
Sought	83	4	6	7
Electric	82.9	4.4	5.7	6.9
Sought	67	1	2	30
Electric	66.6	1	2	30.4
Coke	68.4	0.5	1.7	29.3
Sought	68	1	7	24
Electric	67.9	...	...	...
Coke	69.9	...	...	...

There was no difficulty in draining the metal completely from the hearth and alloys of different composition can be made one after the other without contamination by metal left in from the previous heat.

POWER CONSUMPTION.

On the basis of power read on the high tension side of the transformer, per ton of metal poured, the power consumption on 10 hour operation was 336 K. W. H. per ton, on red brass poured at 1180° C. average. For 24 hour operation, the figure is about 260 K. W. H. per ton, for red brass.

The electrode consumption was 16.3 pounds while melting 21,660 pounds of metal, or 1½ pounds per ton, equivalent to about 40c. at present electrode prices. To this must be added the loss due to accidental breakage. There were nine breakages in melting 72 tons four of which were due to the charge being so bulky that it fell against the electrodes when rocking started, and five to the electrodes being hit while bulky material was being charged. The design of the furnace has now been altered so as to allow the electrode tips to be withdrawn into the walls during the charging of bulky material. When an electrode does break, if nipple joints are used, the breakage is usually of the nipple only.

Since the operation was experimental, it is not yet possible to give exact figures on the life of a lining, but as near as can be estimated the relining cost for labor and material should be well under 50c. per ton with a corundite lining when melting red brass poured at 1150-1200° C. If only yellow brass, poured at 1100° C. is melted, the lining cost will be still lower. If very hot bronze is to be produced, say at 1300° C., the roof and upper portions of the ends should be lined with zirkite brick.

Accurate temperature control is very easy in the rocking furnace, since at the end of a heat, after the "full rock," the walls are no hotter than the metal, and there is no heating up of the charge from hotter roof and walls when the power is shut off, as is the case with those types of furnace where the heat is reflected downward from the roof. After dutting off the arc, the temperature falls very slowly, about 2 to 3° C. per minute. By running the arc a minute or so every 10 or 15 minutes, a charge can be held at pouring temperature for an indefinite period.

One man can operate the furnace, with the aid of a helper while charging. Were automatic electrode control used, which could easily be done, one man could probably attend to two furnaces.

The putput per man hour was greater from the rocking furnaces than from the coke fires. The working conditions are much less severe and more healthful with the electric furnace than with the coke fires, and a man of less rugged physique than is required for coke fires can readily operate the rocking furnace.

Various modifications and improvements in design were made during the tests, and others that could not well be made on the first furnace, are being incorporated in other furnaces of this type now being built for Detroit firms. The electrodes were at first introduced into the furnace directly through the refractory walls. When making yellow brass from new materials so that addition of much spelter is required, the zinc, vaporized during the addition of the spelter of the molten charge, tended to condense in the clearance between the electrode and the hole through which it entered. This would then freeze, solder the electrode in place and cause breakage. Such trouble was later obviated by the use of graphite sleeves about the electrodes and by the proper arrangement and operation of the electrode coolers. It was also found feasible to charge the zinc with the rest of the charge instead of speltering at the end of the heat.

Comparing the cost of melting on a 10 hour schedule in the rocking electric furnace and in the coke fires, of the plant at which the test was made, the sum of the cost per ton of charge for electric power, interest and depreciation, electrodes, linings, and for heating ladles, is just about one-half of the cost per

ton of charge of the single item of crucibles at present prices and at present crucible life. The value of the metal saved by the electric furnace is about twice the cost of the coke used by the coke fires. Hence a huge saving is possible by electric melting under present conditions, and even at a pre-war prices for crucibles, coke and metals, the rocking furnace will show a smaller, but still a distinct saving. On 24 hour operation the balance in favor of electric melting is still more marked.

From data on hand on the power consumption of other types of electric furnaces, it appears that, when operated on the same alloy, heating it to the same temperature, and running the same number of hours per day, the rocking furnace is somewhat more efficient than the direct arc and un-rocked indirect arc types, very much more efficient than electric furnaces of types in which heat is reflected onto the charge from the roof, and very little less so than the induction furnaces. These conclusions follow not only from the data at hand, but from the method of application of heat in the various types, those with the source of heat at a distance from the charge being less efficient than those where the heat is developed close to the charge, while the induction furnaces, with the heat developed in the charge itself, should be the most efficient. On account of the washing of the walls with the metal, the rocking furnace should theoretically come next to the induction type in thermal efficiency.

In magnitude of metal losses, the rocking furnace gives at least as good results as any other type of electric furnace. The only possible loss is from the stream of metal while pouring, as the furnace is sealed tight while running. Volatilization from the stream while pouring is of course about the same in all types of furnaces.

In close control of temperature of the melt the rocking furnace is superior to any save the induction type. In thorough mixing of the charge, the rocking type is about on the same plane as the induction type, and markedly superior to the other types, where, in larger sizes, segregation in the bath may be a serious problem.

For example the following shows the analysis for copper of the first ingot the first ladle and of the last ingot from the last ladle, when melting 1,200 lb. charge of 60% Cu. 37% Zn. 3% Pb.

Heat	1st ingot. 1st ladle	Last ingot, last ladle
322	59.76% Cu.	59.54% Cu.
323	59.78% Cu.	59.66% Cu.

In ability to change from one alloy to another, it is superior to the vertical ring induction type, and in ability to operate cheaply when used but 10 hours a day, without night heating, is ahead of the vertical ring induction type and of the reflected-heat type.

It can handle alloys of any zinc or lead content, being superior on this score to direct arc, unrocked indirect arc and induction types. The electrode cost compares favorably with other arc furnaces. With equal conditions of operation, and suitable refractories in each type, the cost of lining will probably be about the same as with most other types.

Labor cost should be about the same in all hand-regulated arc furnaces. With automatic regulation, which can be applied if desired, the rocking type should show a labor cost about the same as that of any other type.

From the electrical point of view, of desirability of a steady load, the rocking furnace does not have so steady a load and hence, on this score, is not so desirable as the induction furnaces or granular resistors furnaces. It does not require special transforms, as the granular resistor type does. It lacks the electrical advantages of multi-phase furnaces. In very large sizes, two arcs could be used in the rocking type, but in sizes up to one ton, single-phase operation is required, and in a plant so located that the power supply must be of limited capacity, a single-phase arc furnace, with its fluctuating loads, may not be satisfactory from the electrical point of view. Such fluctuation is no drawback in Detroit, nor would it be in most cities or large manufacturing towns.

From the results on furnaces of 125 and 1,300 pounds capacity, it appears that the rocking type can be built in a wide range of sizes without showing a great loss of efficiency in the smaller sizes. This type can doubtless be built in as large sizes as the brass industry could normally use.

In first cost, the rocking type should be no more expensive than other electric furnaces.

While further tests in different plants and under different conditions, which will, at least in part, be made in the near future, are needed to give accurate data on the complete performance of the rocking type of furnace, it would seem from the results so far that it may be of distinct value in the brass industry, especially under present conditions as to crucible prices and quality, fuel supply and prices, and metal prices.

At the conclusion of the tests conducted by the Bureau of Mines, which covered over 300 heats, the experimental furnace was put on regular production by the Michigan Smelting and Refining Company.

The Michigan Smelting and Refining Company is having four one-ton rocking furnaces built, and two are under construction for the Electro-Bronze Company of Detroit.

The patents taken out by the Bureau of Mines on the rocking furnace have been assigned to the Secretary of the Interior as trustee, and free licenses to operate under them can be obtained by making application through the Director of the Bureau of Mines.

Grateful acknowledgment is made to Cornell University for use of the well-equipped Cornell electric furnace laboratory in the work on the laboratory furnace, to Dr. J. M. Lohr, formerly of the Bureau of Mines for aid in the work on the laboratory furnace, to the Michigan Smelting and Refining Company for facilities for the test, and to the Detroit Edison Company, and particularly to Mr. E. L. Crosby of that latter firm, for never-failing co-operation.

A more detailed account of the tests of the rocking furnace will soon be published as Technical Paper 206 of the Bureau of Mines.

[The above matter is contained in a recent bulletin from the United States Bureau of Mines. The bulletin also contains an interesting review of the progress made in electric metal melting practice. A synopsis of the review will be published soon. Ed.]

LOWEST PLATINUM PRICE.

According to the records of a large platinum refinery the lowest quotation for platinum in the American market during the past twenty years was quoted during the year 1898 when $14.40 per ounce Troy was asked for the metal. The next year, 1899, the price advanced to $17.75 per ounce. The present price for platinum as set by the United States Government is $105.00 per ounce.

ELECTRO-PLATING AND ITS RELATION TO THE MANUFACTURE OF PHONOGRAPHS AND PHONOGRAPHIC RECORDS

A Series of Articles Giving Practical Information Regarding the Finishing of Metal Parts. Part 3 and Last.

Written for The Metal Industry by S. Herrick.

After the master has been taken from the wax, a button is soldered in the center on the back to hold it in place while being polished. The polishing machine is a regular light buffing lathe having a disc on the end of the thread the same size as the plate to be polished with a hole in the center and the thread to fit the button on the back of the master plate. The speed of the machine is about 800 R. P. M. The material best adapted for polishing is a fine liquid metal polish applied with clean absorbent cotton. When polishing, as much care as possible should be taken to keep away from the lines as it does not take much polishing to remove the lines of music from the master plate. The face should then be washed with gasoline and dried with clean cotton. The surface will then be ready for the next operation.

The master is then coated with wax on the back and also around the edge to prevent the copper from depositing or creeping and binding over the edge so that the mother plate will strip from the master freely. It is now that many platers will wonder at the method of plating upon a metallic surface and then being able to take the deposit off and have a perfect reproduction of the plate underneath. As the master plate is now polished and coated with wax on the back it is ready for further preparation. A hot solution cannot be used for that will soften and remove the wax. Therefore, only a cold solution can be used for plating. The best method I found is to scour with vienna lime, free from grit. After the surface is thoroughly cleaned in cyanide, silver in the following solution.

Chloride of silver	2½ ounces
Cyanide of potassium	6 "
Water	1 gallon

The above solution is a dip and should not be used with current. A bright deposit is all that is necessary and the brighter the silver the brighter will be the surface of the mother plate when taken from the master. After the master is silvered it is then immersed in the following solution.

Tincture of iodine	8 ounces
Muriatic acid	1 ounce
Water	20 gallons

This operation must be done in one dip or in other words the articles should be dipped in and taken right out. They should then be rinsed with clean water and care taken that the surface is not touched with the hands for that would remove the oxide and the deposit would stick and there would be trouble in getting the master and mother apart. Also be sure to keep the surface wet with clean water until immersed in a copper solution for if it should dry it will also cause the deposit to stick. Should a master plate dry it may be rinsed through the cyanide solution and water and reoxidized in the tincture of iodine solution and then rinsed in clean water as before.

The master plate should be left in the copper bath from twenty-four to forty-eight hours. For large sizes about forty-eight hours and for small sizes about twenty-four hours. Use about 2½ volts and no more as a slow plate is the best. After the master is removed from the bath, the mother can be removed by starting around the edge and once started it should be removed freely with a slight snap. The edges are then ground off on an emery wheel and a button soldered in the center of the back and prepared for the bath again in the same manner as the master.

The next plate is what is called the matrix or stamper. The mother plate should be left in the bath twenty-four hours and it will then have a shell about .022 in thickness. This shell, after being removed from the mother, is first centered and then trimmed around the edge to the desired size, after which it is polished in the same manner as the master and mother plates and is ready for nickel plating. The back of the matrix does not need to be waxed, so a hot potash solution can be used for cleaning prior to plating. As this matrix is used for stamping out the records a hard deposit is needed. Also a very bright deposit, for the brighter the deposit the better the surface of the record. After considerable study the following formula was found to be the best for this kind of work.

Double nickel salts	4 ounces
Single nickel salts	4 "
Sal ammoniac	2 "
Magnesium sulphate	1 "
Boracic acid	1½ "
Water	1 gallon

This solution will give a very bright and hard deposit. After the matrix is plated it is then dried with hot water and blotting paper, a new piece of blotting paper being used for each matrix and the paper should be free from grit. It is then polished as before and ready for the press.

As I believe the foregoing will give the reader a very good idea of the plating end of a phonograph and phonograph record, I will cite some of the troubles in this particular branch of the plating industry. One of the greatest troubles of the record business is what is known as snaps. These snaps are not visible in the different operations but can be heard when the record is played. In preparing the wax, graphite is used and must be polished down to a mirror surface, no surplus being left on the face of the wax. If the surplus graphite is not dusted off, and this can be done with a clean camel's hair brush, it will cause snaps in the master plate, which will in turn be in the mother, the matrix and the record.

Then again the solution must be clean and free from minute particles floating around for they will often adhere to the master or mother and be closed in by the copper deposit also producing a snap. A slight scratch will produce snaps and sometimes a large scratch will spoil the whole selection, which means re-recording. If the selection destroyed is a band selection, it will require for re-recording, one man to record, 18 or 20 men in the band, each man for at least one hour, which, as will be seen, will cost quite a sum of money. On the other hand if it is an opera a very high priced artist must be paid.

So I am sure that readers of this article will readily understand when I say have patience, for I have found from past experience that in this work "patience is a virtue." Pitting in a nickel solution will cause snaps and here is where the study of the old problems of the plating industry is essential.

As I have now given the chief causes of trouble re-

garding the plating of a phonograph record, I will call your attention to some of the problems yet to be solved.

First—The proper composition of a copper sulphate solution and what causes the deposit to be hard and brittle, when the solution has a temperature above 86 degrees Fahr.

Second—Agitation is something that should also be studied a little better. What is best for this class of work as compressed air alone has not been found satisfactory.

Third—Maintaining an equal temperature. The most difficult problem is that of maintaaining, in warm weather, a temperature of not above 86 degrees Fahr. A temperature of about 77 degrees Fahr. has been found to be the best for a copper sulphate solution. If the temperature is above 86 degrees Fahr. I would suggest that the bath not be used.

A BRONZE HONOR TABLET DEDICATED TO THE EMPLOYEES OF R. H. MACY & COMPANY, NEW YORK, WHO HAVE JOINED THE ARMY AND NAVY, BY THE MACY MEN'S CLUB. DESIGNED AND EXECUTED BY W. H. ABBOT.

Fourth—What is the effect of temperature on the deposition? This is a very perplexing problem as all the various seasons of the year must be taken into consideration and the troubles ensuing will be found to be many and varied.

Fifth—What anodes are best to use, especially in the solutions used for plating phonograph records?

Sixth—One of the most difficult problems is in regard to the thickness of the shells. The thickness of the shells may come very near being even, yet sometimes it will be .025 on one side and .018 on the other. I have found out that this trouble is as much in evidence in Europe as in this country and seems to be general where acid copper solutions are used.

There are numerous other problems that could be mentioned but it would require so much space that I will have to leave them until another article.

It is the opinion of many people that a record contains a certain percentage of hard rubber, but the following is about the percentage of the different materials used in their manufacture.

Rotten stone	12 parts
Pipe clay	4 "
Flock	1 part
Lamp black	1 part
Rosin	1 "
Shellac	8 parts

This material is mixed on hot rolls and then rolled flat. A small amount, enough to make one record, is laid on a steam table to soften and then placed in a hydrulic press. The matrix is the die used to press the desired record. Cold water rushing through the jackets of the press cools off the record and hardens it. The record is then taken out and smoothened down around the edge, tested and if found perfect, is ready for sale.

Now as I have tried to give a brief idea of the manufacture of a phonograph record, I would like to see the platers make a study of the different problems that are to be found in such work for I am sure they will find it to be one of the most interesting studies that they could take up and I am also sure they will be repaid for any time spent on such study by the interest involved.

A MARINE FINISH.

A marine finish is a gun metal or navy bronze finish and may be produced in the following manner: Prepare a saturated solution of muriatic acid and white arsenic by the aid of heat. In other words dissolve all the arsenic the muriatic acid will dissolve when heated to 180 degrees Fahr. The solution so prepared should be kept air tight and used as a stock solution.

The immersion solution should be prepared as follows:

Water	1 gallon
Muriatic acid	1 pint
Stock arsenic solution	8 ounces

Heat the solution to 180 degrees Fahr. and immerse the cleaned articles in the solution until uniformly colored a blue black, then wash and lacquer as usual.

A similar solution can be prepared with sodium cyanide and arsenic, the manipulations being the same.

Water	1 gallon
Sodium cyanide	12 ounces
Sodium arsenate	4 "

Use at a temperature of about 180 to 200 degrees Fahr. A little chloride of iron added produces a darker tone, about ½ ounce per gallon of solution will prove effective.—C. H. P.

SPOTTING OF LACQUERED GOODS.

Many platers will find at this time of the year that small white spots will develop on plated articles after they have been lacquered. This is due to the excessive humidity which prevails and the only way to avoid these white spots during this weather is to prevent moisture coming in contact with the lacquers. As a partial preventative the windows in the lacquer room should be kept closed and the articles to be lacquered should be perfectly dry before lacquering, it being advisable to heat the articles to 100 degrees Fahr. in order to eliminate the surface moisture during the damp humid weather.

Also the lacquers should be protected as much as possible when they are not in use and the dipping jars or pans should be equipped with tight fitting covers. It is well to remember that evaporation of the solvents in the lacquers during the damp weather produce condensation of moisture from the air and the moisture will eventually turn the lacquers white due to the precipitation of the cellulose and gum used in their manufacture. Moisture is one of the worst enemies of lacquers or varnishes so if it is desired to produce a good lacquer coating as much moisture as possible should be avoided.—C. H. P.

EDITORIAL

Vol. 16 New York, June, 1918 No. 6

THE METAL INDUSTRY

With Which Are Incorporated
THE ALUMINUM WORLD, COPPER AND BRASS, THE BRASS FOUNDER AND FINISHER, THE ELECTRO-PLATERS' REVIEW.
Published Monthly

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THE METAL INDUSTRY PUBLISHING COMPANY
(Incorporated)

Entered February 10, 1903, at New York, N. Y., as second class matter under Act of Congress March 3, 1879

SUBSCRIPTION PRICE $1.00 PER YEAR, POSTPAID TO ANY PART OF THE WORLD. :: SINGLE COPIES, 10 CENTS
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THE METAL INDUSTRY is a member of the Audit Bureau of Circulations

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GOVERNMENT AND METALS

The Government has commandeered all the platinum, iridium and palladium held by refiners, some importers, manufacturing jewelers and large dealers.

The price fixed for platinum is $105 a troy ounce; for iridium, $175, and for palladium, $135.

Manufacturing jewelers may use 25 per cent of their present stocks for commercial purposes by signing a waiver of all claims for compensation from the Government by reason of the requisition.

Delivery to the Government of manufactured platinum now held or controlled by jewelers will be waived, provided they sign a waiver of claims similar to the manufacturers' waiver.

All handlers of the metals were instructed to forward within five days a sworn inventory of their stocks. Jewelers were required to submit by June 30 an estimate of those metals included in the manufactured articles on which the labor has exceeded 20 per cent of the value of the metal.

Failure to comply renders their stocks of the metals liable to seizure. The prices set are considered by the Government to be fair and to allow sufficient margin of profit to those handling the metals. Platinum has been held by jewelers for as high as $150 an ounce.

THE METAL INDUSTRY has several times referred to the use of platinum for jewelry. We have at no time been in sympathy with its use for the purpose, and we would be pleased to see it gradually disappear from the jewel boxes of our women folk. It is too essential for many war industries, and there are plenty of other metal combinations that can take its place for ornamentation if a white metal is desired. In fact, there are now on the market a number of substitutes that are only distinguished from platinum with difficulty.

A recent issue of the SCIENTIFIC AMERICAN says in this connection:

"It is inconceivable that any person would wear a lead-colored ring or bracelet or other ornament, except because of the false value which its artificially produced high price gives it in his eyes. In doubtful taste at any time, surely now, when our basic war needs for platinum are to be met only with the greatest difficulty, the purchasing of jewelry made from this unattractive metal cannot be considered as anything other than the height of unpatriotism. It is surpassed, in its class, by but one act—that of deliberately, and for the sake of profit, urging those ignorant of the true state of affairs to buy such jewelry."

Now that the Government has stopped the use of platinum to within 25 per cent, it remains with the people to voluntarily give up even this amount. There is also an opportunity for those already possessing platinum in the form of jewelry to show their patriotism.

There is in New York City in the Winfield Building, at Fortieth street and Fifth avenue, what is known as the

War Savings Metal Exchange. Here all metal that it is desired to turn over to the Government may be exchanged for War Savings Stamps. This exchange will accept gold, silver, platinum, etc., and in this way it would seem that quite an appreciable amount of platinum could be collected. We have no doubt but that arrangements could be made to have branches of the exchange located in other cities also, so that no one need feel slighted because they did not live in the city where the exchange was. Moreover, articles could be sent by mail.

So here is an opportunity for the women of America to aid the Government, and also acquire the habit of thrift: Exchange your old (?) jewelry of gold, silver or platinum for Thrift Stamps!

WOOD VS. METAL FOR PROPELLERS

In view of the growing scarcity of woods suitable for airplane propellor blades and of the reports in the daily press that the Germans are successfully using metal for this purpose, we sought for some information on the subject. Replying to a question as to the possibility of using aluminum for propeller blades, one large metal house says:

"The peripheral speed of a propeller such as is used on the Liberty Motor is in the neighborhood of 48,000 feet per minute, and the resulting centrifugal force is so great that it is believed that an aluminum propeller would so closely approach the bursting point that it would be unsafe, if not impossible to use.

"The principal item of consideration of a propeller is the proportion of strength to weight, and the use of wood lends itself more readily to the purpose than would aluminum."

Another large user of aluminum states:

"We have done considerable work in connection with aluminum propellers for airplanes, but the same has not progressed to the point where we are able to go into details in connection with the same."

A large manufacturer of airplanes has the following to say:

"Your letter requesting why a propeller made with a cast hub and wrought blades of aluminum is not suitable for an airplane might best be answered by advising you of some of the experiments the Signal Corps made with composition and built-up propellers.

"They tried a variety of combinations and constructions, ranging from sheet steel propellers, hollow and filled, covered with leather, rubberized compound and other materials, to solid cast propellers of metal turned down to shape.

"These propellers invariably failed due to the enormous centrifugal force developed when tested to the same number of revolutions per minute as a wooden propeller.

"The real solution lies in being able to get a propeller that will be actually lighter than wood and yet more rigid. We firmly believe that until this is obtained we will be compelled to resort to wooden propellers."

So it would seem that considerable attention has been given the matter here in the United States, and that so far nothing has been found to supplant wood. Until one of the machines with the metal blades reported to be used by the Germans is captured, we shall have to be of an open mind and keep on using wood.

The recent appeal by President Wilson to the Boy Scouts to locate black walnut trees shows the need for this material. Propeller blades at present are made from black walnut and mahogany for the outer parts, with centers of oak. It is reasonable to expect, though, that before a great while a metallic substitute will be found.

SUBSTITUTES FOR TIN

The embargo placed upon tin by the Dutch Government and the commandeering of present stocks by the United States Government, together with subsequent abnormally high prices has placed the manufacturers of tin bearing alloys such as britannia and other metals in a serious position. Unless some substitutes for tin are found some firms may be forced to go out of business. Fortunately there are several metals and alloys that lend themselves to the uses for which tin is usually employed.

In the pure metal class the first that may be mentioned is aluminum; this alloy, while considerably lighter in weight than tin, has a specific gravity of 2.66 as compared with 7.29 for tin; if found to be too soft, may be stiffened with a small percentage of copper and may be rolled, drawn, stamped or spun. It has a pleasing color of its own, takes and retains for some time a fine polish and we understand that it is possible to satisfactorily electro-plate it.

Another metal that can be used to good advantage in place of tin is zinc. This metal when produced with a certain minimum of impurities, as is now being done by several concerns, both by smelting and by electrolysis, can also be rolled, drawn, stamped or spun and in fact, about everything can be done with it that tin is capable of. Zinc can be electro-plated with comparative case, and various degrees of hardness can be produced by manipulation in mechanical processes.

The third metal which can be used as a tin substitute, while not being, strictly speaking, a metal per se, may be for the sake of argument called such, is Monel metal. This metal is smelted directly from the ores containing nickel and copper and contains from 68 to 72 parts of nickel with from 26 to 30 parts of copper, with the balance iron. Monel metal is hard, strong and tough, is malleable and can be rolled into sheet, drawn into wire, stamped or spun and is non-corrodible to a high degree, takes and holds a high polish and has a pleasing color. It withstands the action of sulphuric and other acids and can be electro-plated.

Among the alloys are to be found several which give promise of good results. In this connection, Jesse L. Jones, a prominent metallurgist, in answer to a question from a manufacturer of britannia metal, says:

"When extreme lightness is not required in novelty work a mixture of lead, 100 pounds, and antimony, 13 pounds, may be used. This plates well, and if properly made has enough toughness to withstand embossing. The writer has obtained the following tensile results for this alloy:

Tensile strength	7,500
Yield point	3,500
Elongation in 2 inches	20.0 per cent
Reduction of area	18.5 per cent
Brinell hardness	18.0

This alloy is somewhat soft, however, and if a harder and stronger alloy is required, but one that is also cheap, the following mixture may be tried: Lead 78, antimony 14, tin 8. A Brinell hardness of 28.0 may be had from this alloy.

One of the suggestions for the conservation of tin at the present time is the use of alloys of lead and cadmium. The drawback of these alloys is the readiness with which they dross or oxidize. The use of fluxes such as glycerine or zinc chloride reduce the losses from dross. You might try an alloy of lead 92 and cadmium 8.

If you decide to continue the use of high grade britannia metal you can save money by substituting 99 per cent tin for straits."

Another alloy that is suggested as a substitute for tin is known as "Acieral." This metal, as was described in THE METAL INDUSTRY for May, 1917, and April, 1918, is an alloy of aluminum and steel. The name being made up of the French word "Acier" for steel and "Al," the Latin symbol for aluminum. "Acerial" has a specific gravity of 2.82, is wonderfully strong, can be produced in all forms such as sheet, rod, and wire, and can be plated or used without such finish as it can be highly polished and is reasonably untarnishable.

From the foregoing it will be seen that there is plenty of material at hand for the manufacturer of white metal goods now requiring large amounts of tin to choose from in order to continue his business, and it may be that some combination will be found that will answer the requirements so well that there will be no need to change back again should tin once more become plentiful and cheap, which is doubtful.

FLAG DAY AND AMERICANIZATION

June 14 is Flag Day and it is suggested that campaigns for the Americanization of foreigners be started on that day in plants and factories all over the land. As an aid for such a campaign the following program is offered by the National Americanization Committee:

Bugle Call-Rally to Flag-Staff.

Flag Raising:

As Flag rises, "The Star Spangled Banner" should be sung either as solo or in unison.

Salute to the Flag:

(To be given either as song, chant, or spoken words) "I pledge allegiance to my Flag, and to the Republic for which it stands. One nation indivisible, with Liberty and Justice for all."

American's Creed: (To be said in unison)

"I believe in the United States of America as a government of the people, by the people, for the people; whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign nation of many sovereign states; a perfect union, one and inseparable, established upon these principles of freedom, equality, justice and humanity for which American patriots sacrificed their lives and fortunes.

"I, therefore, believe it is my duty to my country to love it; to support its Constitution; to obey its laws; to respect its flag, and to defend it against all enemies."

Address by Four Minute Men.

Song—"America."

CORRESPONDENCE AND DISCUSSION

WE CORDIALLY INVITE CRITICISMS OF ARTICLES PUBLISHED IN THE METAL INDUSTRY

EMPLOYMENT OF WAR CRIPPLES IN METAL TRADES

TO THE EDITOR OF THE METAL INDUSTRY:

The different branches of the metal industry have proved, in Europe a very favorable field for the training of war cripples. The Red Cross Institute for Crippled and Disabled Men, which has for its object to promote the vocational training of our crippled soldiers that would fit them for a remunerative trade, has had a number of metal shops visited and a number of employers of labor in the different lines of the metal trades interviewed, for the purpose of finding out what positions could be satisfactorily filled by crippled men, in spite of their physical handicap.

This investigation has brought out the fact that there are many opportunities in the trade for the employment of cripples. A large proportion of the work is seated, and is therefore perfectly suitable for leg cripples. Manufacturers and managers of plants have indicated a number of positions that could be held by one-armed men.

In sheet metal work alone, the following occupations have thus far been listed as suitable for arm cripples: soldering cans, testing cans for leaks, decorating and touching up, trimming and painting, air brush, rivetting covers, chopping, forming spools, shearing, flattening, feeding automatic machines. In some instances, an artificial work arm would enable a man to do the work. In other, a slight adjustment in the machine, or in the disposition of the material, would make the work accessible to cripples.

It is up to the employers in all lines to endeavor right now to find out in their shops all the possibilities of giving employment to the war cripples. That is their part in the patriotic task of turning war invalids into useful and productive citizens,—which is the only form of national gratitude worthy of their sacrifice.

The Red Cross Institute which is located at 311 Fourth Avenue, New York City, operates an employment bureau to act as the medium between the crippled soldier and partially disabled men and useful work of a permanent kind in which the men can be efficient and self-supporting. Employers in the metal industry are invited to coöperate in this and indicate their willingness to give crippled workers a chance to fill any vacant position on a basis of competency alone.

DOUGLAS C. MCMURTRIE, Director.

Red Cross Institute for Crippled and Disabled Men.

TARNISHING OF SILVER

TO THE EDITOR OF THE METAL INDUSTRY:

As it is not considered practical to lacquer silver flatware, the tarnishing of this class of silver goods has always given trouble. The causes for the formation of tarnish on a silver surface is generally known to those engaged in the manufacture of silver ware, so paper and boxes especially prepared as containers for such goods are secured. Also care must be taken that silver ware is not stored where gas is used for heating or lighting purposes. All such precautions should be observed, but in spite of all that is done the silver will tarnish.

It is a possibility that a substance can be used in the composition of the paper or boxes used for these goods, which would counteract to a large extent the formation of silver sulphide. Or a suitable substance might be found which would diffuse an aroma in the room in which the silver ware is kept and so counteract the formation of sulphide. It is said that camphor will produce this result, but as the price of this material is high, it is likely a cheaper material could be found.

My object therefore in writing this letter is that perhaps there is someone who could give some information which would enable the platers to overcome, to some extent, the tarnishing of silverware.

May 6, 1918. W. W.

SHOP PROBLEMS

IN THIS DEPARTMENT WE ANSWER QUESTIONS RELATING TO SHOP PRACTICE

ASSOCIATE EDITORS: JESSE L. JONES, Metallurgical PETER W. BLAIR, Mechanical CHARLES H. PROCTOR, Plating-Chemical

ALLOYING

Q.—Will you be kind enough to inform me how to alloy 50 per cent. copper and 50 per cent. lead and get a homogeneous mixture.

A.—The alloy of 50 per cent. copper and 50 per cent. lead cannot be made absolutely homogeneous. Even when ingot metal is purchased from smelters who are specialists in making this alloy they are not very uniform in composition and the castings are even less homogeneous. The alloy is used mostly for piston rings and when it is specified it is better to buy the castings wanted from firms who specialize in this alloy.

The secret of making a high lead bronze is in the manipulation rather than in the mixture. If either the copper or lead are allowed to oxidize to any extent, they will not amalgamate. A flux of equal parts of borax and salt will prevent oxidation of the copper.

The original formula for the alloy was:

Copper	50 pounds
Lead	50 pounds
Cyanide of potash	8 ounces
Phosphorus	4 ounces

More recently about 1¼ per cent. of stick sulphur has been used to prevent the separation of the lead. The writer has found sulphur satisfactory when the process is carefully carried out, but when left to unskilled melters, the metal was not uniform. Workmen in foundries that make considerable amounts of this alloy frequently get sick and have to go to the hospital or to the country to recuperate.

If poured too dead the alloy will give spongy castings. The pouring range is much narrower than it is in standard phosphor bronze and it is often necessary, after pouring a few molds, to put the pot back in the furnace and get the metal hotter.—J. L. J. Problem 2,580.

BEARINGS

Q.—Could you kindly recommend a babbitt formula for each of the following conditions?

First .....3,000 r. p. m., 2,000 pounds per sq. in.
Second ..... 300 r. p. m., 2,000 pounds per sq. in.
Length of bearing, 8 inches.

A.—While it is desirable that bearings should be well loaded so that too bulky a design of machine may be avoided, excessive loading is neither essential nor practical. Makers of babbitt some times advertise that their babbitt is giving satisfaction in bearings under a load of 5,000 pounds per square inch, yet these same babbitts when tested, show an actual elastic limit of but 2,000 to 3,000 pounds. It is not good practice to work a babbitt beyond or even near its elastic limit because there are always spots in a bearing where loads are excessive. Due to shaft deflection, irregular scraping and similar reasons, the load on a bearing is not likely to be uniformly distributed. Hence a factor of safety of 5 to 6 should always be maintained.

The writer considers the pressures cited in the above questions as excessive and in the absence of details as to the character of the service for which the bearings are intended, does not care to recommend any babbitt as likely to meet the conditions. If, however, the circumstances are such that lower pressures per square inch than those named, cannot be used, the following combinations might be tried.

In each case make the bronze shell from copper 85, tin 15 and phosphorus 1/10 per cent. This alloy has a high compressive strength. For the first named case, a babbitt might be tried composed of antimony 9, copper 7, lead 1 and tin 83, the thickness of the lining being 1/32 inch. For the second named case try a babbitt composed of antimony 4½, copper 4½, lead 1 and tin 90 per cent., the thickness of the babbitt being similar and it being well tinned and anchored into place.

It should be specified that the shafts should be hardened and ground very accurately, the bearings scraped to a very accurate fit and high pressure oil lubrication used.—J. L. J. Problem 2,581.

CASTING

Q.—We are casting various shaped articles in commercial zinc, and are using ordinary open molds made of mild steel, not under pressure. At first we found that the castings came out quite satisfactory, but in a short time they commenced to bind in the dies and now it is almost impossible to procure perfect castings at all, either as regards surface or quite sound, free from large holes, showing that the metal has not run together. We have used fresh millings of metal, and the results are still unsatisfactory. We might add that we are using commercial zinc cuttings, and are melting down in gas heated pots, and also have a gas flame working round the molds. We have tried the molten zinc in various stages without any better results. Should the metal be used with a flux on the surface, or through the dies being made of steel?

A.—The trouble is due to the erosive action of molten zinc on the steel mold. The zinc castings are thus held rigidly at various points in the mold, owing to the formation of "fins" or protuberances caused by the running of the metal into grooves and hollows eaten by the molten zinc out of the surface of the mold. Steel dies will always be thus attacked in time, but the trouble may be minimized by adding a little aluminum (say 1 per cent.) to the zinc and by coating or "dressing" the inner surfaces of the molds with lamp-black, fumes of burning resin, plumbago and oil or an emulsion of bone-ash and water brushed on to the warm mold and allowed to dry before use. The molds should be kept at as low a temperature with absence of moisture, and the metal poured at as low a temperature as is consistent with fluidity.—W. T. F. Problem 2,582.

DEPOSITING

Q.—A nickel deposit 3 mm. in thickness with an area of 6 ins. by 1¾ ins. has to be obtained on a mould made of linotype metal. This has projections along the centre length ways, the sizes of which are approximately ⅜-in. sq. by ¼-in. in depth, sloping off each way. The distance between each projection on the mould is ¼-in. to in some cases ½-in. The deposit is obtained to the desired thickness readily enough, except between the projections. Can this be corrected in any way? Further difficulty is experienced by the nickel deposit warping during deposition.

A.—The difficulty you are experiencing is a natural one, as projections will always, in obedience to the laws of least resistance which the current follows, acquire a thicker coating in a given period than will be obtained in recesses. The warping of the deposit will be very much obviated by spreading it over a greater length of time. Warming the solution produces more satisfactory deposits.—W. T. F. Problem 2,583.

FINISHING

Q.—We wish to finish some silver buckles in old Egyptian finish like samples. Can you inform us how the dead surface is obtained? Please give full details.

A.—After the buckles are soldered they should be dipped in a hot 6-1 oil of vitriol pickle, then bright dipped and silver plated. After the buckles have been silver plated they should be dipped in a liver of sulphur solution until they are a uniform dead black. Scratch brush with a fine steel scratch brush and F F pumice until the dead gray is obtained. Use a flat lacquer.—O. A. H. Problem 2,584.

LETTERING

Q.—Can you give us information as to a method of lettering on heavy tin plate. We wish to fill these letters with a red paint or enamel and would like to print it or stamp it in, so as to do away with the wiping off of the surplus paint.

A.—The simplest method for you to pursue in filling the letters in the embossed tin plate would be to use one or more of the plates as a gauge, cut the letters through and adjust them carefully so that the space on the plate to be enameled or printed can be seen in detail. Solder some lugs on the master plate so that each plate will be in the same position.

Then use a regular lacquer spray brush suitable for enamel colors or paints. Spray the enamel or paint through the apertures in the master plate and this will fill the letters in on the under plate without covering any of the other surface or necessitate wiping out.

The letters on the plates could also be painted in by hand, but this would be a tedious operation and the spraying method is a rapid and economical one.—C. H. P. Problem 2,585.

PLATING

Q.—From time to time we have calls in the plating room for galvano. We have to make this galvano off of a wax or plaster cast and after it is finished we seem to have trouble with a web gathering on the outside. If you know of any different process of making galvano and if there is any way to get a clean cut edge on the outside of the piece proper, we would be glad to have you advise us?

A.—Your inquiry does not give very detailed information as to the trouble experienced. By the term "web gathering on the outside" we infer that the metal deposit is of a web-like structure or formation. If this is correct then the trouble is caused by your solution and there are several reasons for this.

First—The solution is too low in metal.

Second—The solution lacks free acid.

Third—The solution needs a conductive agent.

Fourth—Solution should be agitated by compressed air as the lack of agitation is frequently the cause of webbing.

To overcome your trouble we would suggest the following additions per gallon of solution.

Add 1 ounce of sulphuric acid and 2 ounces of powdered alum. Agitate the solution, if possible when you are doing this class of work exclusively through the day, then each evening revive the solution by placing bags in it containing copper sulphate. The copper sulphate will dissolve over night and replenish the metal in solution lost through the day by deposition.—C. H. P. Problem 2,586.

POURING

Q.—We would appreciate it very much if you would advise the temperatures necessary when pouring white metals, such as babbitt, lead, solders, etc.

A.—The temperatures most advisable for pouring white metals are those which correspond very closely to their melting points. Or, in other words, the pouring temperature of a metal should be as near its melting point as is consistent with the purpose for which the metal is to be used. That is in casting this point is governed by the fact of whether the casting is thick or thin, large or small.

In your case if, as we understand it, you wish to pour this white metal simply in ingot molds, the temperature should be practically fifty degrees above the melting point, so if you were pouring tin, for instance, which melts at 450 degrees Fahr., the pouring temperature should be about 500 degrees Fahr. In the case of lead it would be 621 degrees melting and 670 degrees for pouring.

Of course, the temperature for solder would be governed entirely upon its constituents. A fifty-fifty solder would melt at a different temperature from a sixty-forty one or so on. In general the melting points of alloys conform fairly closely to the mesne of the melting point of their constituents.—K. Problem 2,587.

RECOVERING

Q.—I would like information regarding a method of recovering gold from an old gold solution. I am familiar with the method of evaporation and mixing with litharge, but wish to know a chemical method similar to the one of recovering silver.

A.—To recover gold in a metallic state from an old gold solution procure some zinc shavings or turnings and place them in the gold solution. The gold will deposit upon the zinc shavings by simple immersion and when all the gold has been reduced in this manner remove the zinc, wash carefully and dissolve the zinc in muriatic acid. The gold will be left undissolved in the form of small spangles of metal. Filter the gold from the acid and wash it and it then can be used in any form desired.

The remaining zinc chloride solution may be used for soldering.

Another method is to deposit the gold out electrically, by using carbon for the anodes and thin sheet of zinc for the cathode. Use a regular current and add very small proportions of cyanide to the old gold solution until all the gold is deposited out, then recover the gold by the acid method as noted above.—C. H. P. Problem 2,588.

WELDING

Q.—We have in our business one operation which consists of attaching cast iron to cold rolled steel, or, in other words, we make valves for gas motors with cast iron heads and steel stems. We have been in the habit of threading the stem, screw it into the cast iron head and oxy-acetylene welding same on upper side. We want to improve on this and also if possible reduce the cost.

We have taken up the matter with a number of iron foundries and they all maintain that they cannot cast heads on to steel stems successfully.

We would like to ask if you could give us any information in this connection and would also like to hear if you think that electric arc welding would give successful results.

A.—In casting cast iron parts upon steel a number of difficulties are experienced. First—If the cast iron is too hot it may entirely melt off the steel. Second—If the cast iron is not hot enough it will not unite with the steel, while the metal at the joint, because of lack of fluidity, produces a section that is porous and full of blowholes.

Third—Cracking of the cast iron or warping of the steel may result. Electric arc welding ought not to be any more satisfactory than oxy-acetylene welding.

Oxy-acetylene welding, using a welding rod composed of about 88 per cent. copper, 9 per cent. aluminum and 3 per cent. iron, has been found to be very satisfactory for welding cast iron to cast iron, the joint being much stronger than the cast iron itself. The reason for this probably is that some of the copper oxidizes and the copper oxide acting on the graphite carbon of the cast iron, rapidly burns it out so that the final weld is very strong. This welding rod will also unite cast iron to steel. If so desired the bronze weld may be covered up by welding upon it a small amount of soft iron. It is suggested that you try this aluminum bronze welding rod for your gas motor valves.—J. L. J. Problem 2,589.

MELTING

Q.—We shall be glad to know why melting pots for lead, tin and zinc alloys are not run off by a tap from the bottom instead of being ladled out from the top? Is it because the pressure of the metal is so great in the pot that it cannot be controlled by a tap?

A.—The reasons such posts are not controlled by a tap at the bottom are:

(a) Tapholes of the ordinary clay-plugger type are too risky to adopt, owing to the danger of a break-out.

(b) Such tapholes would be difficult to use in such a way that the delivery of metal would be under perfect control.

(c) Ordinary metal taps attached to iron pots would not be practicable to use, owing to the certainty of fluid metal freezing and clogging up the working parts.—W. T. F. Problem 2,590.

PATENTS

A REVIEW OF CURRENT PATENTS OF INTEREST

1,261,342. April 2, 1918. **Process for the Production of Zinc.** Otto Baltin Lipive, Germany.

In the reduction or distillation of zinc residues, oxid of zinc and other ores in a muffle it has under certain circumstances been found advantageous to briquet the ores preferably in such a form (*e. g.* oval, rounded, polygonal or the like) that the bricks touch each other at as small as possible number of points, so that large intercommunicating spaces are formed for the passing off of the reduction products of metallic vapors.

In raising the temperature of the muffle to a point suitable for free reduction or passing of vapors, melting or slagging of the ores of the briquets sometimes occurs. This is a serious drawback, as it causes the filling up of the spaces between the briquets thus obstructing the free passing of the reduction products.

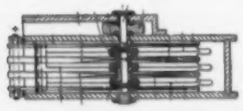
The object of the present invention is to obviate these drawbacks.

According to this invention and in order to successfully counteract the objectionable results of melting away or slagging of ores of the kind mentioned or of a mixture of ores and reducing agents certain substances are added to the brick muffle charge which prevent the bricks melting away or turning into dross.

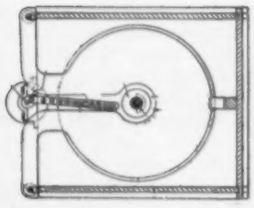
One of such substances, for example, is naphthalin which is added in small quantities to the charge and which very considerably increases the refractory nature of the bricks. The addition of naphthalin is already known in the manufacture of so-called patent fuel, also the capability of the napthalin to increase the fireproofness of bricks in itself is known, and this known capability is utilized with special advantages for the production of zinc.

1,262,248. April 9, 1918. **Apparatus for the Electrolytic Production of Copper and Other Metals.** Marcel Perreur-Lloyd, of Boulogne-Sur-Seine, France, assignor to Marie Victorine Bailly, widow Garin, of Paris, France.

The object of the present invention is to provide new apparatus for effecting the electrolysis of metallic solutions in general, copper, nickel, gold, silver, iron and so forth with production of compact deposits and with employment of strong currents. The apparatus is simple in construction, occupies relatively small space and is of high efficiency.



Electrolysis with soluble anodes has been applied with success in the past few years, especially for the refining of copper.



The electrolysis of poor and impure solutions of copper and other metals with insoluble anodes has, however, not been attained with industrial success. The electrolytic apparatus of the present invention allows of effecting practically the electrolysis of metallic solutions in general.

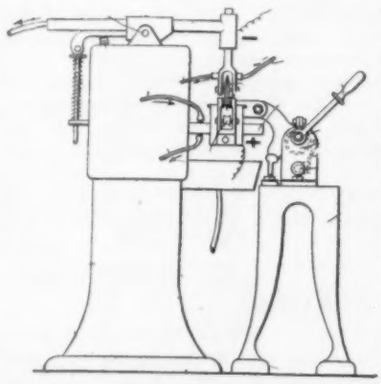
In general apparatus with moving cathodes present a high electric resistance and occupy considerable space; they are very expensive and necessitate large installations for small productions. The apparatus of the present invention aims to avoid these disadvantages.

In this apparatus, as shown in cut, the cathodes are constituted by disks mounted on a shaft and rotating more or less rapidly, according to the nature of the electrolyte, opposite stationary anodes. The anodes may be of any suitable material, for example lead, carbon, fused magnetite, etc.

1,262,653. April 16, 1918. **Process and Apparatus for Autogenous Welding.** Pietro Paoline, Milan, Italy.

The present invention relates to a process and apparatus for autogenous welding.

The object of the invention is to effect the said welding by a simpler, more economical and industrially more practical system than any other used heretofore.



The invention consists in the fact that the lips of the tube to be welded are led between and maintained adherent to the opposite edges of the two stationary plates, preferably of copper (positive pole), and a revolving roller of suitable material (negative pole or vice versa), while the tube is fed on according as the welding progresses, means being provided for cooling, guiding and pulling the tube, and accessorial arrangements, all of which are also claimed in so far as they exhibit the character of novelty either separately or in their application to the object of the invention.

The idea underlying the invention and the way to carry it into effect will be readily understood by reference to the annexed drawing.

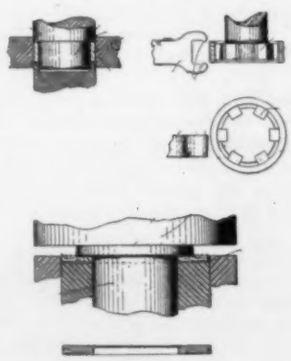
1,262,973. April 16, 1918. **Method or Art of Making Molds for Casting Fluid Metals.** Charles Pack and Leo Frank Nock, of Brooklyn, New York, assignors to Doehler Die Casting Company, of Brooklyn, New York, a corporation of New York.

The invention consists primarily in a method or art of making molds for casting fluid metals, consisting in forming plastic material about a fusible pattern, melting said pattern while in the mold, causing the formation of a thin stratum or film, of a medium repellent to the material of the pattern between the mold and the pattern while it is being melted, flowing the molten material of the pattern from the mold, and drying the mold.

The patterns are preferably made in a metal die or mold, the molten metal being forced into said die or mold under pressure. By the use of a master metal die or mold and a duplication of said die or mold in plastic material in the manner herein described, castings may be produced in sufficient number and with sufficient rapidity to make the method or art commercially practicable.

1,263,271. April 16, 1918. **Process for Making Metal Rings.** Frank Mossberg, Attleboro, Mass.

This invention relates to processes for the manufacture of finished metal articles, such as rings made of ductile metal, and among its objects are to effect the maximum saving in the cost of manufacture, not alone in labor, both machine work and machining, but also to effect the maximum saving of material in the producing are article.



In particular, one application of the process is the production of copper rings such as are used on shells to engage the rifling of a barrel. These rings must be of extreme accuracy, although only used once, and the saving of material, therefore, is a most important item, while the cost of manufacture in view of the accuracy required is relatively great, and economy in the production in any

degree is of great saving, and the aggregate economy in the production of such articles, as compared with methods heretofore used is, therefore, of great value.

The patent covers: A process for making metal bands, comprising the production of an annular metal blank, confining the blank between dies, as shown in cut, having opposed faces disposed to induce a flow of metal radially inwardly, applying pressure substantially normal to the face of the blank to an extent causing a flow of the metal radially inward, supporting said blank during the pressing with means limiting the flow of material in a radially inward direction, and applying pressure to the resultant annular ring to transform the same into a tubular ring.

1,263,395. April 23, 1918. **Rust Proofing Composition and Process of Making Same.** W. B. Emig, Toledo, Ohio.

This invention relates to a coating material for iron and the like, which is strongly adherent, durable and weatherproof, and will protect the surface of iron, etc., to which it is applied for a very extended period from the action of the air and other oxidizing influences.

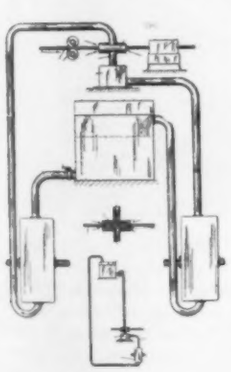
The materials which are preferably employed, and the preferred proportions thereof, are as follows:

Gray iron fillings	⅛ oz. avoirdupois
Strong commercial phosphoric acid (which may have a strength of about 88%)	¼ oz. liquid measure
Burgundy pitch	1¼ oz. avoirdupois
Boiled China wood oil	2 oz. liquid measure
Turpentine	8 oz. liquid measure

In preparing the improved rust-proof composition from the above ingredients the iron filings are mixed with the phosphoric acid to form a paste, the pitch is first melted and the boiled China wood oil is added thereto, while the pitch is being constantly stirred and heated, and when the boiling temperature is attained the mixture of paste formed by the iron filings and phosphoric acid is added to the mixture. The batch is stirred constantly until effervescence ceases. If an air drying coating is desired two ounces or so of any well-known drier, litharge, or the like may be added. After the above components have been brought together and the liquid has become quiet the turpentine is stirred into the same and the mixture is further agitated. It is then allowed to cool and settle and is ready for use.

1,263,858. April 23, 1918. **Apparatus for Applying Coatings to Bars, Rods, Pipes, etc.** W. L. Cole of Mile End, London, England.

This invention relates to the application of coatings or fluids of various kinds to bars, rods, pipes, ropes or any like articles made in lengths of approximately uniform section.



It is the object of this invention to provide for the automatic application of the coatings in such a manner as to avoid waste, or contamination of surrounding objects with the coating material, while insuring that the coating shall be regularly and uniformly applied.

The patent covers: An apparatus, as shown in cut, for applying a coating material to an article such as a bar, rod, tube and so forth, said apparatus comprising a fitting with apertures therein through which the article is adapted to pass longitudinally with some clearance, a vessel for containing the coating material, means for supplying the coating material from said vessel and for delivering it to the interior of the said fitting, a pipe leading out from said fitting back to the said vessel, and suction feeding means in said pipe adapted to draw fluid out of said fitting at a faster rate than that at which the coating material is supplied thereto, and thus to draw in air around the article at the apertures of the fitting, whereby the said suction feeding means is enabled to return the residual coating material which has not adhered to the article back to the vessel together with any air drawn in at the apertures of the fitting.

1,264,459. April 30, 1918. **Alloy.** Charles Vickers, of Niagara Falls, New York, assignor to the Titanium Alloy Manufacturing Company, New York, N. Y., a corporation of Maine.

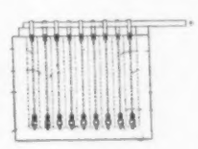
This invention relates to a method for making aluminum bronze which is claimed to have advantages over any now in use. The product covered by the patent is a composition, or alloy, of copper aluminium, and iron, the aluminium constituting ten per cent. and the iron four per cent. of the whole.

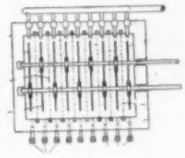
The inventor describes his method as follows:

"I charge into the bottom of the crucible, or other container, to be employed in the melting, the iron in thin sheet form, such as tin plate, or planished sheet iron, and, of course, in the proportion required to insure its percentage determined upon for the final product. Upon the iron thus charged, I further charge the required proportion of copper, and then melt these two metals, so charged, together. To this molten charge I then add the required proportion of aluminium, thereby insuring that any theretofore undissolved iron shall go into the solution, and thus insure homogeneity, and other desirable properties, in the final alloy product, the which, after its complete formation, I run into molds, cool, etc., as usual."

1,264,802. April 30, 1918. **Electrolysis of Sulphate of Cadmium Solution.** Edwin James Hunt, of Oldbury, and William Thomas Gidden of Waverley, England, assignors to Chance and Hunt, Limited, of Oldbury, England.

According to this invention in the electrolysis of a sulphate of cadmium solution containing free sulphuric acid with lead anodes free particles of undissolved lead compounds are prevented from contaminating the metal depositing at the cathode by preventing their access to the cathode and for this purpose a porous diaphragm may be interposed between the electrodes or the anodes or the cathodes may be surrounded with porous material. This is shown in the accompanying cut.

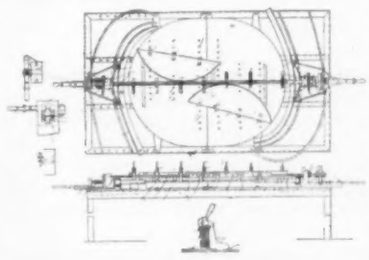




The function of the diaphragm or porous material which may conveniently consist of asbestos cloth is to prevent insoluble lead compounds formed at the anodes from reaching the cathodes, but the diaphragm should be sufficiently porous to permit of as free circulation as possible of the liquor so that the electrolyte is substantially the same at the anode and cathode.

1,264,248. April 30, 1918. **Bending-Machine.** C. M. Yoder, Cleveland, Ohio.

This invention relates to apparatus for bending rods, bars, sheet metal strips or bands and other articles into any desired shape. The invention is especially adaptable for bending a metal plate, strip or band edgewise or in its own plane without in any wise crimping, twisting or deforming the metal.



One object of the invention is to provide improved means for bending sections of metal, as shown in cut.

Another object of the invention is to provide improved means for fastening and moving either or both ends of the section of metal to be bent.

Another object of the invention is to provide improved means for bending a section of metal and preventing twisting, springing, bulging or crimping thereof while being bent.

EQUIPMENT

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST

ALUNDUM, ARTIFICIAL VS. NATURAL ABRASIVES

WRITTEN FOR THE METAL INDUSTRY BY A. B. FRITS, NORTON COMPANY, WORCESTER, MASS.

The influences of the war have further strengthened the already established dominance of artificial abrasives in the grinding and polishing industries. Although during the past decade the most marked tendency of the grinding industry has been the decline of emery and corundum with the increasing prominence of the electric furnace abrasive materials, strange to say, many heads of polishing and electroplating departments, until recently, have been slow in recognizing their supremacy. The stimulation of the metal working industries, plant extensions, and speeding-up of production all along the line have created a demand for not only an increased supply, but also for the most reliable and efficient material. The exclusion from American markets of certain kinds of emery and the difficulties in obtaining even the inferior qualities places many users of polishing material in a rather precarious position during this period of unusual industrial activity, that the country is going through. This has resulted in the adoption by the wiser of the abrasive users products of a kind that are more likely to be permanent and inexhaustible.

They have gone through an experience with unsuccessful substitutes that has been a costly one. Their failure to take hold of the artificial abrasives a few years back may not have been due entirely to a desire to continue in the old way because it was the easiest road to travel. On the other hand, perhaps, the manufacturers of the electric furnace products themselves were not sufficiently active in developing new fields for these abrasives.

The position of electric furnace abrasives, particularly in the grinding wheel industry, is shown by the yearly production reports made to the United States Geological Survey. The quantity of artificial abrasives manufactured in the United States and Canada has increased from a little over 4,000 tons in 1908 to more than 50,000 tons in 1917.

Many polishers who had never tried Alundum or the other artificial abrasives were willing to experiment with them after their emery supply was cut off, but it was then too late, as the demands of the grinding wheel industry far exceeded the production of abrasives. The abrasive manufacturers, however, immediately took steps to meet conditions, with the results that there has been a tremendous increase in the production of abrasives at the big electric furnace plants located on both sides of the Niagara River. As soon as the grinding wheel industry was taken care of, the polishing industry was given a chance and now there is manufactured a sufficient supply of the artificial abrasive, Alundum, to meet all probable demands from both the polishing and the grinding wheel industries.

A number of large manufacturers, however, who had looked ahead to a permanent supply of raw material, have been operating the polishing room on the same systematic and efficient basis as the rest of the shop. They were not hit

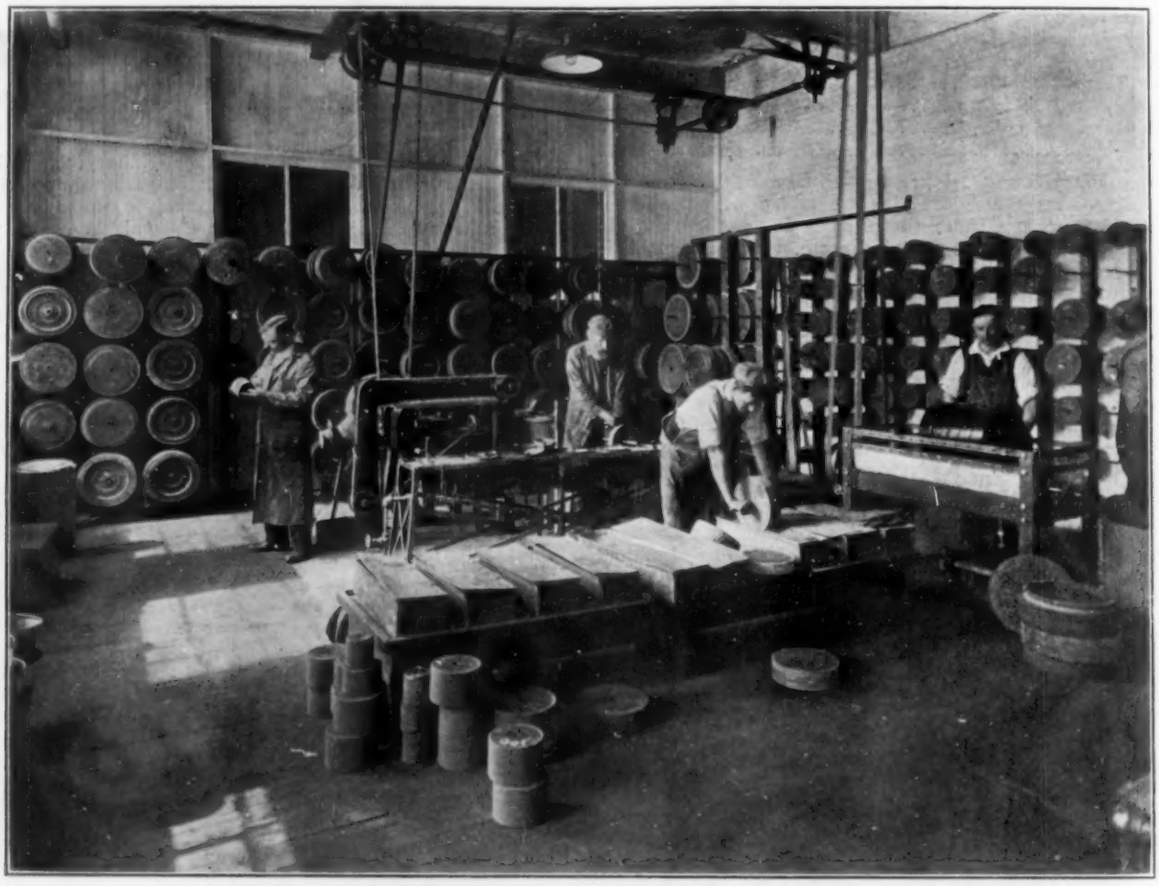


FIG. 1. AN "ALUNDUM" WHEEL SETTING UP ROOM IN A LARGE MANUFACTURING PLANT.

nearly so hard when the war cut off the incoming supply of natural abrasives. Figures 1 and 2 show the wheel setting up room and a general view in the polishing room of one of the large manufacturers of the East who has been using Alundum for polishing for a number of years. Eighty per cent of the polishing abrasive used is this electric furnace product.

There is ample evidence shown by the reports from users of this electric furnace product that it is a much more efficient and economical abrasive for polishing than the emeries on account of the greater purity and the character of the grain. The difference in first cost of material is usually more than equalized by the difference in cost of setting up polishing wheels. It is maintained by many of the polishers who use the material that fewer wheels are

144 pcs.....2 whs. with 2 coats	144 pcs.....6 whs. with 2 coats

Lock Nuts (For Bicycle).
Kind of wheel used: 12 x 3 inches Compressed Canvas.

No. 60 Alundum.	No. 60 Alundum.
1,160 pcs.....1 wh. with 2 coats	46 pcs.....1 wh. with 2 coats
1,440 pcs.....1 wh. with 1 coat	45 pcs.....1 wh. with 2 coats
1,420 pcs.....1 wh. with 1 coat	49 pcs.....1 wh. with 2 coats
1,340 pcs. (av.).1 wh. with 1.33 costa	46.7 pcs. (av.)..1 wh. with 2 coats

Spinning Sprocket (Bicycles).
Kind of wheel used: 12 x 3½ inches Rag wheel.

No. 60 Emery.	No. 60 Emery.
420 pcs.....1 wh. with 2 coats	35 pcs.....1 wh. with 2 coats
320 pcs.....1 wh. with 2 coats	33 pcs.....1 wh. with 2 coats
420 pcs.....1 wh. with 2 coats	30 pcs.....1 wh. with 2 coats
387 pcs. (av.).1 wh. with 2 coats	32.7 pcs.

(This operation is very severe on abrasive, as the sprocket is placed on a plate and allowed to spin with the wheel.)

A POLISHING ROOM IN A LARGE FACTORY. EQUIPPED WITH "ALUNDUM" WHEELS BY NORTON COMPANY, WORCESTER, MASS.

required. Such a curtailment means a reduction in glue bills, considerably less time consumed in setting up wheels, and a much greater production. This is substantiated by a number of reports of recent tests during which accurate records of the performance of each polishing wheel were carefully tabulated.

The followinng figures are of interest, although further details of the tests may be obtained if desired.

Cast Iron Bracket—Flat Sides (Piano Part).
Kind of wheel used: Felt 10 x 3 inches.

Pieces Polished. No. 120 Alundum.	Number of Wheels Used.	Pieces Polished. No. 90 Competitive.	Number of Wheels Used.
200 pcs.....	1 wh. with 1 coat	200 pcs.....	3 whs. with 1 coat

Faces of Bracket (Piano Part).
Kind of wheel used: Felt 12 x 3 inches.

No. 120 Alundum.		No. 120 Competitive.	
225 pcs.....	1 wh. with 2 coats	225 pcs.....	3 whs. with 2 coats

Cast Iron Hatchet.
(Roughed 2 inches on sides, edge and back of claw.)
Kind of wheel used: Leather Covered Black, 14 x 3 inches.

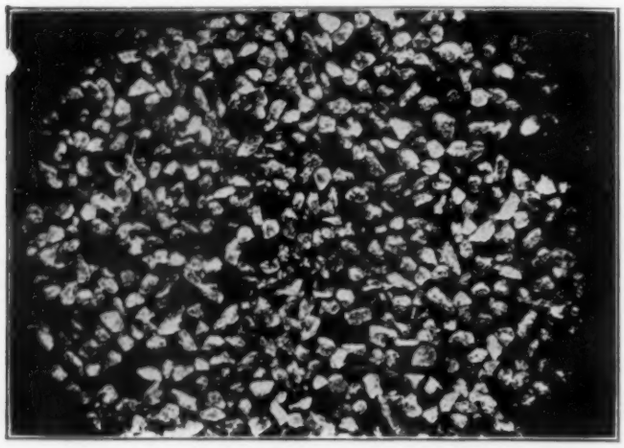
No. 60 Alundum.	No. 54 Competitive.

There is no one particular operation wherein the material succeeds more than in others. It is applicable to all kinds of polishing.

In the polishing room shown in figure 2, the size of the wheels vary from 6″ to 17″ in diameter. Eighty percent of the wheels used are set up with 60, 80, 120 and 150 grain Alundum. The operations consist of polishing sewing machine parts, barker clipper parts and machine tool parts. Alundum has been used here for 12 years. It has rendered satisfaction in plants where an excellent surface is required for electroplating, such as the cutlery industry, bicycle parts, stove parts that are nickel-plated, hardware, and so forth. It is being used extensively in the agricultural industries, and in large quantities for polishing plows. Its success is not confined to any one metal. It is giving equally good results on steel and its alloys, cast iron and metals of the non-ferrous type.

A study of the accompanying photomicrographs showing the character of the grain of various abrasives is interesting. The artificial abrasives are freer from impurities than the

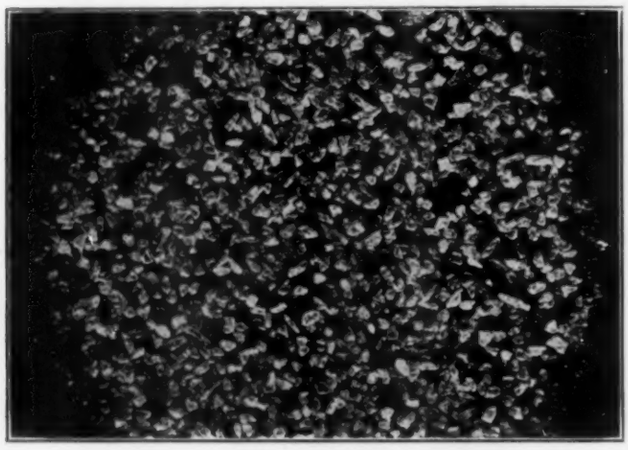
natural abrasives that are available for commercial use; the processes of manufacture are under control. The desirable qualifications are sharpness and uniformity. It is very clear that the material that is furnished in uniform quality will prove a faster cutting material and more economical to use. It is no secret that the average emery has associated with



A PHOTO-MICROGRAPH OF TURKISH EMERY.

it impurities which are detrimental to its cutting qualities as an abrasive, and that the aim of the grinding wheel manufacturers has always been to obtain a material that is uniform in quality, dependable as to source of supply, and high in abrasive properties.

Artificial abrasives have more aluminum oxide present than



A PHOTO-MICROGRAPH OF NO. 90 ALUNDUM.

the natural abrasives, and it is more evenly distributed. As aluminum oxide is the cutting element of an abrasive, it is easy to understand why Alundum is a more uniform and efficient cutting material than emery. This difference in uniformity of quality may be seen under the microscope and to a degree in the photomicrographs shown here.

REPAIRING FURNACE LININGS

By B. H. Rowley, Joseph Dixon Crucible Company.

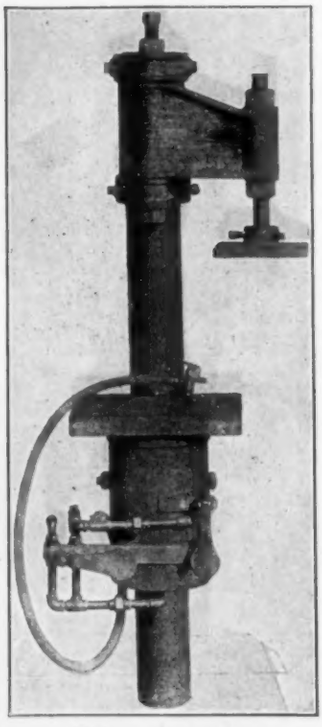
Frequently the furnace lining fails at a time when it is impossible to shut the furnace down for extensive repairs. This is particularly true at this time when everyone is endeavoring to do all he can in the way of increasing production. Dixon's Furnace Cement (C. C. & G.) will prove an invaluable aid in keeping furnaces on the job all the time. It is a crucible clay and graphite mixture of a most refractory nature and successfully withstands great heat.

It will prevent delay and save expensive repairs by stopping the rapid destruction through excessive heat from furnace linings after they have become cracked. It is also used for patching cracked or worn fireboxes around boilers. It is only necessary to mix Dixon's Furnace Cement into a paste with water, and if especially rapid drying is desired, add 1/10 part of molasses or silicate of soda to the water. To obtain the best results this mixture should soak a week or two, and the longer it is soaked before use the better results will be. It is a good plan to keep a quantity in soak at all times and to add driers when material is needed.

Those interested should write to Department 12-V, Joseph Dixon Crucible Company, Jersey City, N. J., for prices and more information.

POST SQUEEZER POWER-OPERATED

This machine is designed as a cheap, space saving power squeezer. The working parts are attached to a 7-inch heavy hydraulic pipe, the end of which pipe is set in a cement block in the foundry floor. Both the head and the cylinder of the machine may be located at any point on the pipe thus making the tool fit the size of the operator. The head is swung to either side when not in use and is thus taken entirely out of the operator's way.



THE POST SQUEEZER.

The machine is a rapid acting squeezer and will do any work that can be done on either a power or hand machine. It is, in fact, a cheap power machine, simpler, more compact and more rapid working than the more formal types. It is equipped with a blow valve and also fittings for a vibrator. Both the vibrator and the cylinder are worked by knee valves, so that no hand motion is required in operating. The cylinder is 7 inches in diameter and the machine has been thoroughly tested for over a year. It is a new type of the power squeezer and it is believed that its space saving quality and its cheapness will make it most popular with the trade. The machine is manufactured by the B. & B. Manufacturing Company, of Indianapolis, Ind.

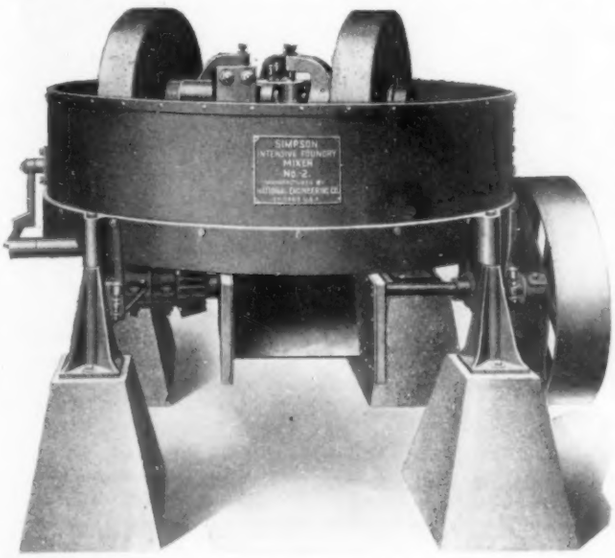
SIMPSON FOUNDRY MIXERS

The Simpson intensive foundry mixer herewith illustrated consists of a circular pan which is stationary. In the center of the pan a shaft is located, to which is keyed a central supporting casting, the latter resting on a turret in which are the bearings for the central shaft, the latter being operated by bevelled gearing which is located below the machine and out of the way of the sand and grit. The central supporting casting carries the plows and mullers. The function of the plows is to turn over and move the sand mixture alternately inwards and outwards, the outside plows moving the mass of sand inwards toward the center and the inside plows moving the sand outwards towards the pan rim, while the mullers revolve on their own axis around the center of the pan, the pathway of the mullers being at a point where the mixture is heaped up the highest by the movement of the plows. The action of the plows together with the kneading and squeezing action of the mullers result in a thorough incorporation of all the elements of the mixture regardless of its composition.

In an ordinary foundry of forty to fifty molders, the attention of one man is all that is ordinarily required to mix all of the core sand and facing sand for the entire shop, which is a very great saving of labor when compared with the very inefficient

idea where every molder mixes his own facing sand by hand. Generally the saving effected by the concentration of the sand mixing operations WILL AMOUNT TO THE PRICE OF THE MIXER IN A FEW MONTHS.

A charge for the No. 1 or 4 foot Simpson mixer is from 3½



THE SIMPSON SAND MIXER, MANUFACTURED BY THE NATIONAL ENGINEERING COMPANY, TACOMA BUILDING, CHICAGO, ILL.

to 4 cubic feet, and for the No. 2 or 6-foot size a charge is from 7 to 10 cubic feet of sand, which includes its quota of coal dust, when facing sand is being mixed, or binder when core sand is required.

The actual time of mixing depends upon conditions, but approximately two minutes or less suffices for core sand, or in the case of facing sand, either for steel or gray iron, three or four minutes may be necessary depending upon the condition of the sand and the toughness desired; because the longer the mixture is subjected to the mulling action of the rollers the tougher and more plastic the mass becomes.

These machines are manufactured by the National Engineering Company, Tacoma Building, Chicago, Ill.

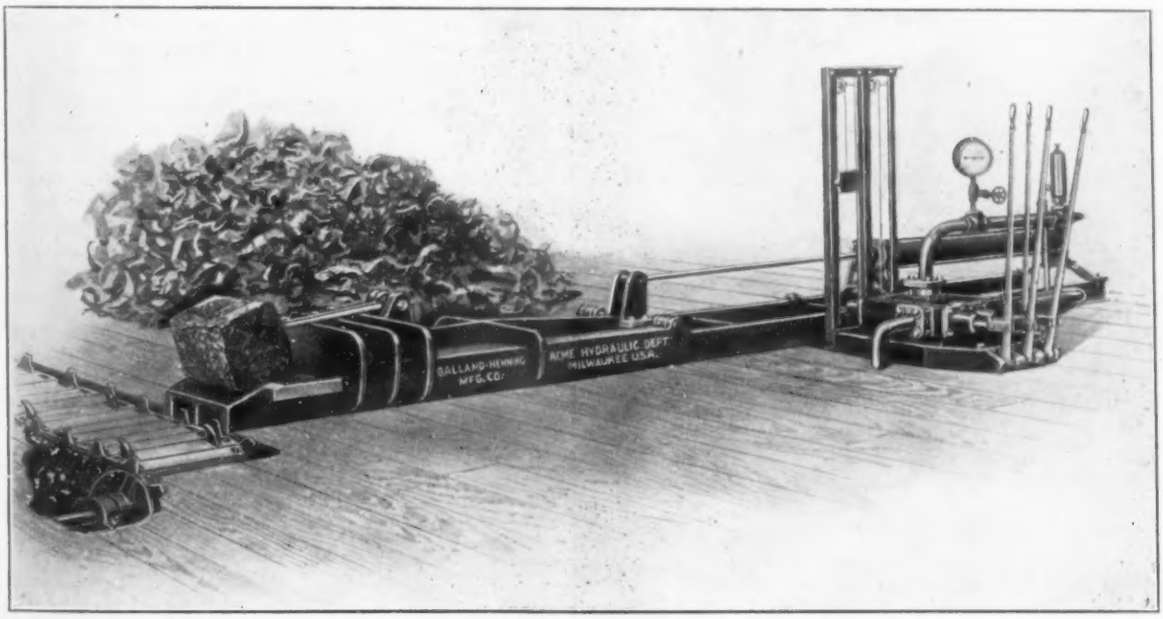
NEW SCRAP METAL COMPRESSOR

We illustrate herewith a hydraulic scrap metal compress which is the result of very extensive experience in the development, production and sale of machines for bundling of scrap metals. There are embodied in these models every essential feature necessary to produce an efficient machine which will stand the rough usage this class of equipment is generally put to. The various forms of scrap metals, including the sharp, thin edges of sheet scrap, generally result in wedging between plunger heads and inside of charging box and which has caused the greatest amount of annoyance and damage to other machines, is practically eliminated in design. Compressed bundle of scrap is automatically discharged from compress without addition of a single moving part; the same operating lever which controls the pressure mechanism removing the finished bundle. Bundle can be automatically conveyed onto scrap heap; into car for shipment or into hopper.

Protection against wedging of scrap is assured by the charging box construction which is provided with V grooved liner plates. These plates are case hardened and bolted in position. The plunger heads are accurately machined to fit. (Patents Pending.)

Steel castings and forgings are employed throughout in the construction of the compress box and the pressure mechanism. All parts are interchangeable, and the pressure plunger heads are provided with an adjustment to take care of the wear. The pressure pistons are finished by grinding and polishing and are of large diameter, which enables high compressing pressures to be obtained with a low operating pressure. This construction tends to avoid leakage and insure long life to the operating valves and pump. The cover of the compress box is a heavy steel casting that is moved and automatically locked in place by air pressure. This box in the machine illustrated measures 24 x 30 x 60 inches and the finished bundle is 12 inches square and 24 inches long.

The operation is controlled by a three lever operating valve. A solid forged block is employed for the valve body, while the plungers are of tool steel, specially graduated to equalize pressure. The capacity of this machine is approximately 4 tons per hour, and one man is all that is required to operate the entire equipment. Ordinarily, a helper is employed to assist in charging scrap into the machine, and the rate at which this is done together with the nature of the material handled affects the capacity. As actually installed the machine is flush with the floor line. These machines have been recently put upon the market by the Galland-Henning Manufacturing Company, Milwaukee, Wis., with New ork offices at 120 Liberty street.



SELF-EJECTING SCRAP METAL COMPRESSOR, MANUFACTURED AND INSTALLED BY GALLAND-HENNING MANUFACTURING COMPANY, MILWAUKEE, WIS.

METAL MEN IN THE SERVICE OF THE ALLIES—SERIES 6

Major Percy C. Thomas received his commission as major in the Ordnance Department from Adjutant General McCain on April 19. In July, 1892, Major Thomas entered the employ of the Rome Manufacturing Company, Rome, N. Y., with which he has since been connected, now being its secretary and treasurer and general manager of the Rome Locomotive and Machine Works, a part of the Rome Manufacturing Company.

In public affairs he has taken a keen interest and has served the Chamber of Commerce as its president. He is a director of the Rome Trust Company, vice-president of the Rome Club and a director in the Teugega Country Club. He is also a member of the Board of Water and Sewer Commissioners and takes a great deal of interest in the work done by that board.

THE HONOR PAGE

The Metal Industry invites anyone connected with the metal trades who is in or has friends in the service to send in photograph and story of career.

Under date of May 20 the firm of **D. C. and W. B. Jackson**, engineers, Boston, Mass., notify us that two members of the firm had, up to that time, entered the National service and a third member expected to do so within a few weeks. In view of these facts the firm will close its office and suspend business for the further duration of the war.

Robert T. Bowman, son of Robert K. Bowman, an official of the J. L. Mott Company, Trenton, N. J., and grandson of O. O. Bowman, vice-president of the Mott company, has enlisted in the Quartermaster's Department and been assigned to Camp Dix. Young Bowman was educated at the Princeton Preparatory School and at Rutgers College.

Benjamin G. McManus, formerly of Ilion, N. Y., has entered the United States service as Second-Lieutenant U. S. G. N. A.

MAJOR PERCY C. THOMAS

THE METAL INDUSTRIES AND WAR WORK

How the firms engaged in the metal business have backed up America in the fight for Liberty is shown in the record of subscpitions to the Third Liberty Loan and the second Red Cross War Fund. We have only space to print a few names, but they are typical of the entire industry. In relation to the Red Cross fund a remarkable number of firms report subscriptions from 100 per cent. of their employees and in one case, that of the Coe Brass branch of the American Brass Company, Torrington, Conn., the report is 105 per cent.

Bridgeport Brass Company, Bridgeport, Conn.—This company's and employees' subscription to the Third Liberty Loan amounted to $320,240.

Winchester Repeating Arms Company, New Haven, Conn.—Subscription to the Third Liberty Loan was as follows.

Employees	$850,000
Company	500,000
	$1,350,000

Scovill Manufacturing Company, Waterbury, Conn.—Employees' and company's subscriptions to the Third Liberty Loan amounted to $1,000,000.

Gorham Manufacturing Company, Providence, Conn.—Subscription to the Third Liberty Loan by the company, $200,000; employees, $112,700.

American Hardware Corporation, New Britain, Conn.—The total subscription of the company and employees to the Third Liberty Loan was $315,000.

H. Mueller Manufacturing Company, Decatur, Ill.—This company and its employees' subscriptions to the Third Liberty Loan amounted to $99,500.

International Nickel Company, New York.—The Board of Directors of the International Nickel Company at a special meeting held at its office May 23, ordered a donation of $100,000 to the American Red Cross.

Moller & Schumann Company.—Every employee of the Moller & Schumann Company, Brooklyn, N. Y., subscribed to the Third Liberty Loan and its industrial honor flag contains ten stars.

Doehler Die-Casting Company.—The employees of the Brooklyn plant of the Doehler Die-Casting Company, Brooklyn, N. Y., subscribed to the third Liberty Loan to the extent of $56,000.

THE ROME WAR CHEST

Why Rome, N. Y., decided to raise a war chest is told in an interesting booklet issued by the Rome War Chest Association.

In November, 1917, the continual solicitation in the City of Rome, N. Y., of funds for war relief and similar purposes culminated in the realization on the part of some of "Rome's live wires" that a central organized body was necessary to handle the appeals successfully.

They appreciated that $100,000, raised and disbursed by a Committee only after careful investigation of each case, to prove positively that every dollar subscribed was used for war relief purposes, would do more good than three times that amount raised by the usual promiscuous donations, and disbursed without any authoritative check as to its ultimate use.

With this thought in mind a meeting of a number of business men was held, and various plans were discussed. As a result the Rome War Chest Association was organized and duly incorporated with a President, Vice President, Secretary-Treasurer, and seventeen Directors, all officers and

FACTORY WAR CHEST ENLISTMENTS.

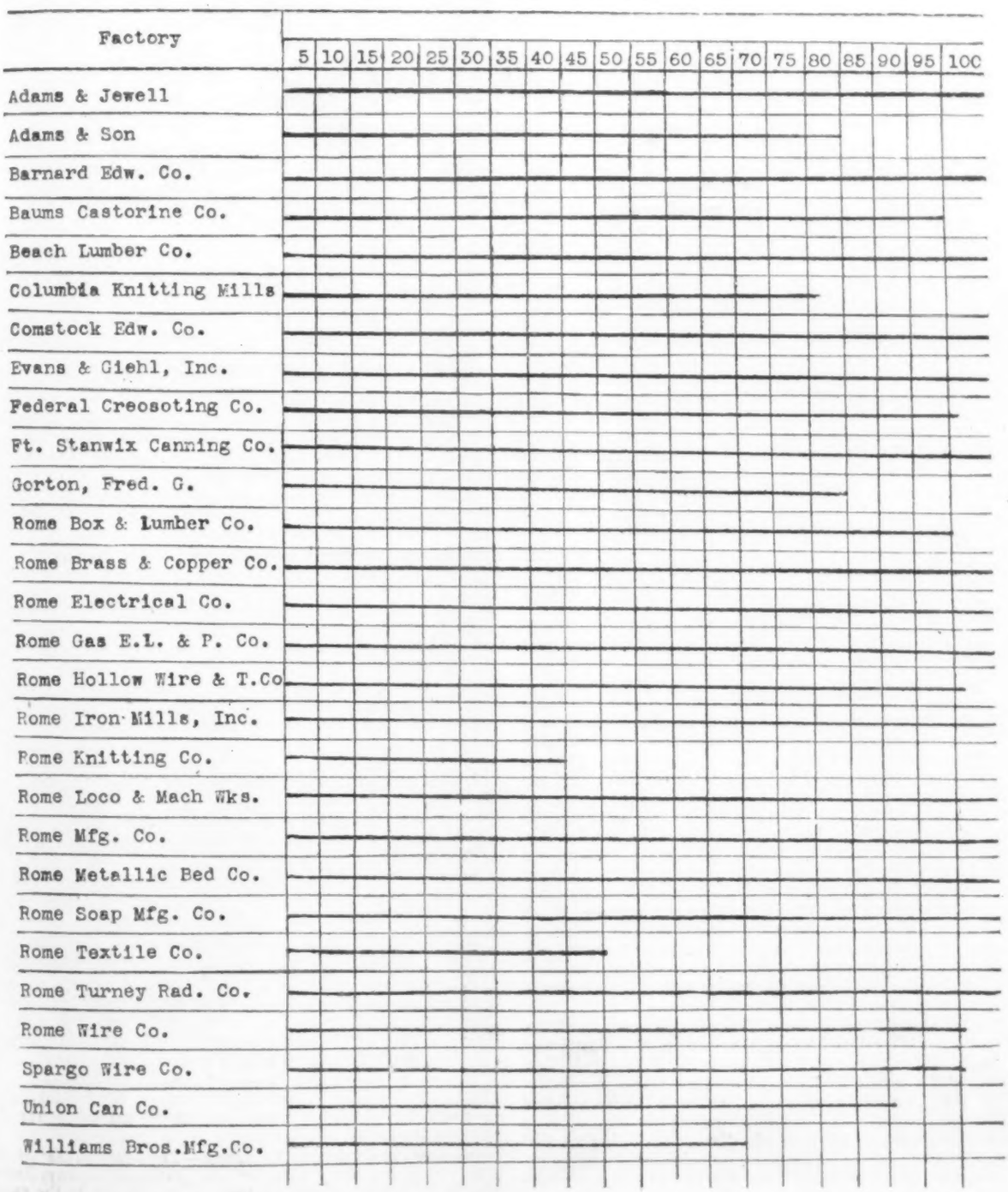

Factory
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Adams & Jewell
Adams & Son
Barnard Edw. Co.
Baums Castorine Co.
Beach Lumber Co.
Columbia Knitting Mills
Comstock Edw. Co.
Evans & Giehl, Inc.
Federal Creosoting Co.
Ft. Stanwix Canning Co.
Gorton, Fred. G.
Rome Box & Lumber Co.
Rome Brass & Copper Co.
Rome Electrical Co.
Rome Gas E.L. & P. Co.
Rome Hollow Wire & T.Co
Rome Iron Mills, Inc.
Rome Knitting Co.
Rome Loco & Mach Wks.
Rome Mfg. Co.
Rome Metallic Bed Co.
Rome Soap Mfg. Co.
Rome Textile Co.
Rome Turney Rad. Co.
Rome Wire Co.
Spargo Wire Co.
Union Can Co.
Williams Bros.Mfg.Co.

CHART SHOWING HOW THE FACTORIES AT ROME, NEW YORK, "LINED UP" ON THE WAR CHEST.

directors serving without compensation. The only expenses of conducting the Association are the salaries of a cashier and bookeeper. Office space for the cashier is provided by the Rome Trust Company in its lobby, and for the bookkeeper by the Rome Chamber of Commerce.

The campaign which was carried out was successful beyond expectation and was conducted along the following lines:

The Publicity Committee were determined that Romans should think, hear, and talk nothing but War Chest during the campaign. With this in view, large posters were placed in every store window, on both sides of all of the ornamental lighting posts in the city, and in every department of all the factories. Cloth banners reading "Help Fill the War Chest" were distributed to be placed on all automobiles, street cars, and delivery wagons, so that every moving vehicle should carry the slogan.

A large chest, on the raised cover of which was painted "Help Fill the War Chest," was erected in a prominent place in the heart of the City. This was lighted by a spotlight, and a cut of the chest on white arm bands distributed to the solicitors to be worn during the campaign. Mass meetings addressed by prominent speakers as well as soldiers of the Canadian Army who had seen service at the front were also held.

The factory employes were a unit almost by themselves. The fact that 95.77 per cent. of the people employed in the factories, in which teams were organized, were subscribers to the War Chest is evidence of the perfection of detail in their campaign. The result of the factory subscriptions is shown in graphic form by the cut on preceeding page.

The Result:

The grand result of the Rome War Chest campaign gave a total of $345,000 per year for the duration of the war. There are over 8,700 subscribers which is 40 per cent of the population of the city and the amount per capita is $16.00. Since the Rome campaign set in, cities principally in New York State, have taken up the idea and it will probably spread all over the country. There is no better way to carry on the noble work of backing up the boys "over there."

ASSOCIATIONS AND SOCIETIES

REPORTS OF THE CURRENT PROCEEDINGS OF THE VARIOUS ORGANIZATIONS

AMERICAN FOUNDRYMEN'S ASSOCIATION

C. E. Hoyt, manager of Department of Exhibits, has issued the following announcement concerning the convention to be held in Milwaukee, Wis., the week of October 7:

The 1918 convention of the American Foundrymen's Association and affiliated organizations will meet in Milwaukee the week of October 7, and concurrent therewith will be held the annual Exhibition of Foundry and Machine Shop Equipment and Supplies.

Splendid accommodations are afforded these joint functions in Milwaukee's great auditorium halls and meeting rooms for simultaneous sessions, excellent cafe and dining room accommodations. The alterations that have just been completed provide exhibit space in Machinery Hall of 180 x 245 feet, and in the Arena, 100 x 225 feet; all this under one roof and within ten minutes' walk of hotels.

Floor plans showing the layout of the exhibit halls are now being printed and will be mailed you the coming week together with application blanks and general information.

These conventions will bring together the members of the American Foundrymen's Association, who represent the gray iron, steel and malleable casting interests of the United States and Canada; the Metals division of the American Institute of Mining Engineers, formerly the American Institute of Metals, representing the non-ferrous metal casting and brass and copper rolling mill industries; the Iron and Steel section of the American Institute of Mining Engineers, representing the blast furnace, steel works and rolling mills, and the American Malleable Castings Association, representing the malleable casting industry.

The men who will attend this Congress and who are directly affiliated with every branch of the metal-working trades, are probably in closer contract with activities for the conduct and successful prosecution of the war than any similar body of men of any other industry. The subjects of many of the papers, addresses and discussions will bear directly on operations to facilitate production and to speed up the manufacture of ordnance, munitions, ship castings, etc. Never before has such an alliance of simultaneous meetings of such great technical organizations been attempted, the war being the impelling motive that prompted this undertaking.

It has been suggested that the Congress be opened with a joint meeting of the members of the four societies, and that speakers of national fame be invited to deliver addresses. They would sound the patriotic note that would underlie the deliberations of the four organizations, which would be continued throughout the week.

The exhibition of all kinds of metal working equipment will incorporate the most recent improvements in machinery to increase production and to supplant the country's constantly declining man-power. In addition it is planned to have an exhibit of war materials representing the output of the metal trades. Such a display will be of tremendous educational value to all manufacturers, the majority of whom have little knowledge of the application of the part or parts which they are manufacturing to the assembled war machine.

AMERICAN ELECTRO-PLATERS' SOCIETY

Providence Branch.—Meets the second and fourth Wednesdays at 26 Custom House street, Room 16. John McDonough, president and Albert J. Lemrise, 124 Waverly place, Providence, R. I., secretary.

The following men were elected to membership: Messrs. Brown, Callahan, Poyton, Simpson and Paul. The librarian of this branch, Mr. Wood, presented his resignation as he has enlisted in the United States Navy. The delegate appointed to attend the convention to be held in Detroit, Mich., July 1 to 3 was Albert J. Lemrise, with George Weigand as rst alternate and John McDonough, second alternate. The following officers were elected for the ensuing year: George Weigand, president; John Andrews, vice-president; Albert J. Lemrise, secretary and treasurer; Fred Grant, librarian; Harry Green, chairman of board of education and Galvin, J. Tyndall, Alfred Senecal, John McDonough, Louis C. Martin and John E. Garrick, board of managers and Harry Sholes, sargeant at arms.

Indianapolis Branch.—Meets second Saturday in month at the Hotel Denison. B. D. Aufderheid, president and Louis Mertz, secretary, 1725 Union street, Indianapolis, Ind.

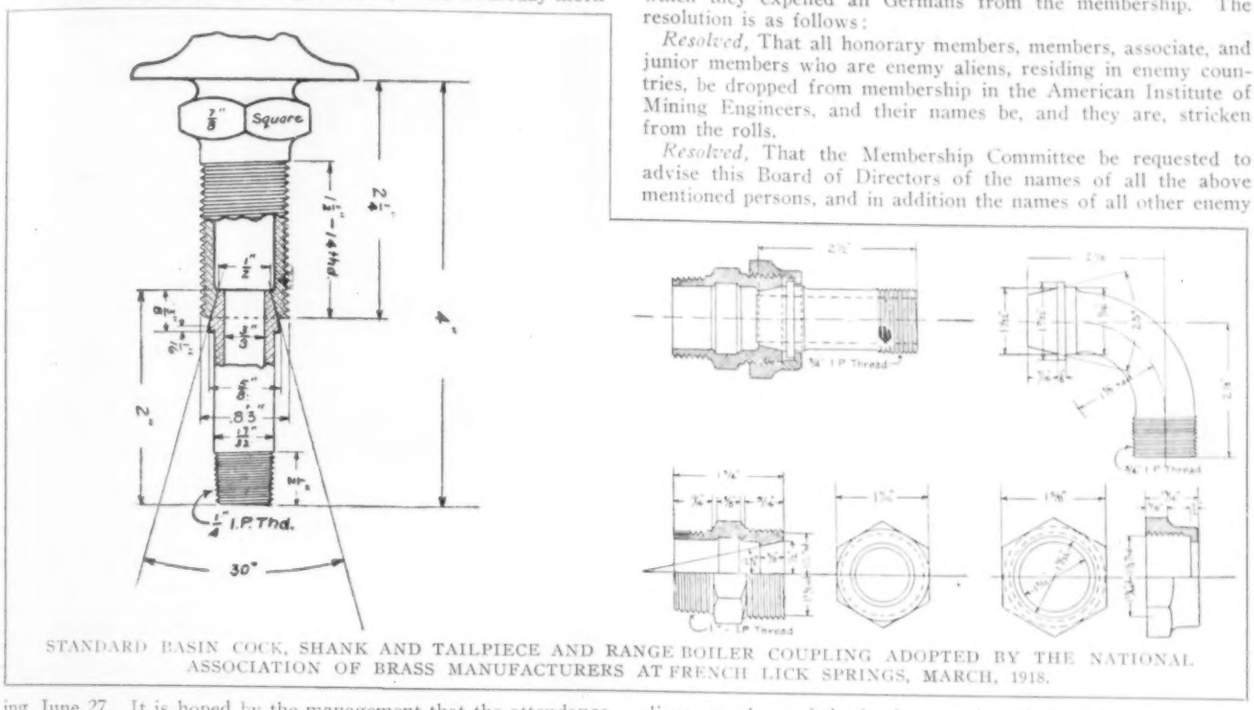
The regular monthly meeting was held on May 11, at which time the following officers were elected:—R. Hennessey, president; C. Cromer, vice-president; Louis Mertz, secretary-treasurer and George Becktel, F. McDonald and R. McCracken, board of managers and H. C. Warner, librarian.

The Indianapolis Branch up until the present time had a room in the Manual Training High School for its plating outfit, but as that school is now closed the Technical High School has offered the use of one of its room.

AMERICAN SOCIETY FOR TESTING MATERIALS

The twenty-first annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., beginning with the opening session at 10 a. m. on Tuesday, June 25, and closing with an evening session at 8 p. m. on Friday, June 28.

Among the features of special interest to those engaged in the metal industries are topical discussions on "Co-operation and Industrial Research," held Wednesday evening, June 26, and "Season and Corrosion Cracking of Brass," held Thursday morning, June 27. It is hoped by the management that the attendance at these particular sessions will be large.



STANDARD BASIN COCK, SHANK AND TAILPIECE AND RANGE BOILER COUPLING ADOPTED BY THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS AT FRENCH LICK SPRINGS, MARCH, 1918.

MINING ENGINEERS EXPEL GERMANS

Now that the American Institute of Metals is a section of the American Institute of Mining Engineers it will prove interesting to the membership of the institute of metals to read the resolution passed by the engineers at a recent meeting by virtue of which they expelled all Germans from the membership. The resolution is as follows:

Resolved, That all honorary members, members, associate, and junior members who are enemy aliens, residing in enemy countries, be dropped from membership in the American Institute of Mining Engineers, and their names be, and they are, stricken from the rolls.

Resolved, That the Membership Committee be requested to advise this Board of Directors of the names of all the above mentioned persons, and in addition the names of all other enemy aliens, members of the institute, and, be it further

Resolved, That, in the case of said latter class, this board shall consider and act upon the question of expulsion after ascertaining their attitude toward the Government of the United States.

It is supposed that this resolution will apply with equal force to the Institute of Metals.

PERSONALS

ITEMS OF INDIVIDUAL INTEREST

FRANKLIN W. HOBBS

Mr. Hobbs, it will be remembered, was the winner of THE METAL INDUSTRY prize for 1913, which had been offered for an article giving an account of the greatest progress in the plating, founding or machine shop practice. Mr. Hobbs' article was "The Filtering, Agitating and Heating of Nickel Plating Solutions," published in the August number of THE METAL INDUSTRY in 1913.

F. W. HOBBS.

Mr. Hobbs was born in Bangor, Me., and attended the public schools of Thorndike and Caribou, Me. Mr. Hobbs early started out in industrial life, his first engagement being as steam engineer and dynamo tender, in the meantime perfecting himself in electricity through the medium of a correspondnce course.

Mr. Hobbs later moved to Bangor, where he is at the present time, and after several connections, mainly in the plating industry, he became connected as foreman plater with Wood & Bishop Company, where he is to be found at the present time. Mr. Hobbs certainly deserves great credit for having taken his degree in the university of the world, as he was forced to leave school early and obtain his present efficiency not only in his chosen field, but also in general knowledge, by home study and observation.

George B. Hogaboom, of 561 Stanley street, New Britain, Conn., has been engaged by the United States Bureau of Standards as electroplater advisor to the military authorities under that bureau. Mr. Hogaboom, who has been employed in the research department of the Scovill Manufacturing Company, Waterbury, Conn., has been granted an indefinite leave of absence and has already entered upon his new work which will take him all over the country. Mr. Hogaboom, who has written several articles for THE METAL INDUSTRY, has also headed the electroplating departments of the P. & F. Corbin division of the American Hardware Corporation and the International Silver Company, during the past few years.

His duties as plating advisor will be to confer with military officials regarding applications of electro-plating; to visit plants engaged in the plating of military supplies and make through official channels recommendations for improvements and to assist in the electroplating investigations in progress at the Bureau of Standards. So far as his time will permit, his services and advice will be available not only to government officials, but also to persons engaged in the manufacture of government supplies.

Archibald R. Lemieux, for the past nine years connected with the Ansonia Manufacturing Company, Ansonia, Conn., maker of brass goods, has returned to Worcester, Mass., to be vice-president and general manager of the Worcester Manufacturing

Company, Osgood Bradley building, which is engaged in the production of war munitions for the government.

Robert Coe has accepted a position as construction engineen with the Bristol Brass Company, Bristol, Conn. He is widely known as a construction engineer, having recently completed a large contract for the New Britain Machine Company in New Britain, Conn.

William J. Bell, formerly foreman plater for Gray and Davis, Inc., manufacturers of automobile lamps, etc., Amesbury, Mass., has connected with the Hartford-Sterling Company, Philadelphia, Pa., and is in charge of its department for zinc plating aeroplane parts.

A. C. Sickles, has resigned his position as casting shop manager of the Brown's Copper & Brass Rolling Mills, Ltd., New Toronto, Canada, and is now connected with the Baltimore Tube Company, Baltimore, Md.

William J. Salmon has resigned his position with McLaughlin & Company, Toronto, Canada and is now connected with the Canadian Hanson & Van Winkle Company, Toronto, Canada, as salesman and representative.

DEATHS

Adam Weaber, inventor of "Weaber's gun metal" used in the Civil War, and known as the non-burst metal, died at his home in Vineland, N. J., on May 1, after a lengthy illness. Mr. Weaber, who was born in Lebanon, Pa., in 1838, was an expert brass metal worker in Philadelphia for many years. In 1884 he went to Vineland, where he conducted a brass foundry up to the time of his death.

PHILIP M. SCHEELER

Philip M. Scheeler, treasurer of the Buffalo Wire Works Company, and secretary-treasurer of the Buffalo Galvanizing and Tinning Works, Buffalo, died April 23, after one day's illness of pneumonia. Mr. Scheeler, while only 33 years of age, had comparatively large business experience in the wire cloth field, having entered the firm of the Buffalo Wire Works Company shortly after his graduation from public school at the age of 14. His first occupations in the wire cloth business were that of minor positions in the office and factory, going from one department to another and learning the trade thoroughly from the minutest to the broadest detail. After his experience in the various departments his inventive and new ideas soon enabled the production of various new types of weaving machinery as well as appliances and improvements to machines already in the plant and in the year 1908, after the death of his father, Philip Scheeler, Sr., who was then president of the company, Philip M. Scheeler was elected treasurer and assistant general manager, which position he occupied at the time of his death. In the year 1916 he was also elected secretary-treasurer of the Buffalo Galvanizing and Tinning Works, a subsidiary company.

PHILIP M. SCHEELER

TRADE NEWS

BUSINESS REPORTS OF THE METAL INDUSTRY CORRESPONDENTS

BRIDGEPORT, CONN.

JUNE 10, 1918.

The past month has been a busy one in Bridgeport as it probably has in many other cities in the country. Various activities, culminating with the Red Cross War Fund campaign, kept the city on the go from the first of the month until the end.

Factories in Bridgeport are all busy and although some of them have been hampered with a slight scarcity of labor it is estimated that the new "Work or fight" law will soon do away with this. At the present time there is need in Bridgeport of additional workers for the various factories but this need will probably be met when the workers at unnecessary occupations are drafted to fill the factory ranks.

Early in the month labor trouble cropped up again in the city. The machinists' union, or the greater part of it, went on a brief strike. The men walked out of the factories of the Liberty Ordnance and the Remington Arms, besides various smaller concerns. For a short time it looked very much as though the greater part of the war work in the city would be tied up by the striking machinists, but the men voluntarily voted to go back to their work.

The housing question, as usual, is predominant in Bridgeport at the present time. This question has been the city's largest one ever since the so-called "war boom." Workmen seeking places to live in the city have often been compelled to leave their families in other cities for the lack of sufficient accommodations for them in Bridgeport. The question has been occupying the attention of many of the city's prominent men, and a housing company was formed some time ago with a view of bringing relief.

The Government has promised to loan $3,000,000 to aid in the erection of houses in and near the city, this sum being underwritten by many of the factories and private individuals of Bridgeport. Thirty per cent of the loan must be paid in seven years and the balance in another seven years. Among the prominent factories in the city who have undertaken part of the underwriting are the following: Singer Sewing Machine, American Graphaphone, Bridgeport Brass, American Tube and Stamping, Warner's, Bullard Machine Tool, Bryant Electric, Locomobile, Raybestos, Bilton Machine, Lake Torpedo Boat, Burns & Bassick, and the Ashcroft Manufacturing companies.

Employes of the Lake Torpedo Boat Company recently received from Secretary of the Navy Josephus Daniels, a letter of congratulation upon their splendid showing in the last Liberty Loan drive. The employes of the factory subscribed for $115,000 worth of Liberty Bonds, the total standing second in the list of Bridgeport factories and the per capita of the Lake men being the highest in the city. Over 96 per cent of the men employed bought Liberty Bonds, a total of 1,543 men being represented.

The Bullard Machine Tool Company recently proclaimed that they were hereafter going to hire all men above the draft age and those who have been rejected by the draft board. These men are to be taught special branches of the machinists' trade and paid extraordinarily high wages. The serious inroads of the draft into the army of skilled mechanics has made this step almost necessary and it is thought that other factories will soon follow the steps of the Bullard company.

Bridgeport looks with pride on the final result of the recent Red Cross War Fund drive in this city. As Walter B. Lashar, president of the American Chain Company, and chairman of the local chapter, so fittingly stated at the closing banquet of the drive, the success of the campaign was a tribute to the factory workers of Bridgeport and all the credit for the city's marvellous showing should go to them. Bridgeport has among its factories a large number of foreign owned ones from whom large contributions for patriotic causes cannot be secured as they are given elsewhere. In this way the city has always been rather handicapped compared with other New England indus-

trial centers, but this time the workers of the city rose above their limitations and placed Bridgeport in the first ranks of the country's best cities.

The quota assigned for the city was only $350,000 and the campaign committee immediately decided that they would raise this quota themselves. Accordingly it was fixed at $600,000 before the drive started. At the final banquet of the campaign, with some reports still not in, the grand total amounted to $781,000, and it is estimated that when the final figures are disclosed Bridgeport will have contributed very close to $800,000 to the Red Cross.

Among the factories which took a prominent part in this splendid contribution are the following: Union Metallic Cartridge Company, $53,000; Bullard Machine Tool Company, $22,926; Singer Sewing Machine Company, $17,974; Lake Torpedo Boat Company, $17,000; American Graphophone Company, $16,000; Locomobile Company, $15,000, and Remington Arms Company, $12,000. These sums were contributed by the employes of the factories and do not include the sums contributed by the companies themselves.

Bridgeport led the State in the total contributions to the campaign and it was mainly through the efforts of the employes of the various factories that this was accomplished, as individual subscriptions of large amounts were few and far between.

L. M. P.

TORRINGTON, CONN.

JUNE 10, 1918.

Eighty per cent. of the present output of all Torrington factories is on war orders, according to information secured by THE METAL INDUSTRY correspondent from an authoritative source. This percentage is especially remarkable in view of the fact that this has never been classed as a munitions town.

All fuel used for producing steam power in the local factories is being received on priority orders, according to a statement made by George H. Atkins, fuel administrator for this district. This includes both anthracite and bituminous coal.

"The manufacturing plants in Torrington could increase their output 20 per cent. if shipments of materials needed in the manufacture of munitions could be pushed through," was the statement made a few days ago by a prominent local manufacturer. Owing to the freight congestion at the various terminals, a great quantity of raw materials are being shipped by motor truck through the states of New York, New Jersey, Massachusetts and Rhode Island.

A new system of distributing the bonuses to the office employees of the Coe Brass branch of the American Brass Company has gone into effect. Under the old system, the bonuses were paid at the end of each quarter. Now they are divided up and added to the weekly pay. This is substantially an increase in the weekly pay, although it is still designated as a bonus.

Frederick F. Fuessenich, president of the Hendey Machine Company, observed his 70th birthday on Tuesday, May 7, by formally presenting to the town of Torrington a large tract of land known as League Park to be used as a public playground and recreation center. The gift is designated as a memorial to his wife, Elizabeth Blake Fuessenich, and the only condition attached to the gift is that the park shall be known as the Elizabeth Blake Fuessenich Playground. The tract is valued at over $25,000. Mr. Fuessenich has been president and treasurer of the Hendey Machine Company since 1906. He has been associated with the company since 1870, when it was formed as a partnership by Henry J. and Arthur Hendey. He has played an active part in the development of Torrington and has figured prominently in public life. At various times he has served as town clerk, burgess of the borough, state senator from the 30th district, and has filled other positions of responsibility and trust. He is a Mason, an officer of Trinity Episcopal Church, vice-president of the Torrington Club and a director of the Torrington Y. M. C. A.

The foremen of the Hendey Machine Company united on May 2 in a farewell banquet at Hotel Winchester, Winsted, to Wendell P. Norton, who resigned as works manager at the Hendey plant after many years of service. Announcement of Mr. Norton's retirement was printed in last month's issue of THE METAL INDUSTRY. A gold watch was presented to him by the foremen of the shop as a token of their affection and esteem.

Numerous changes have been made in the arrangement of the machinery in the press department at the Coe Brass Branch of the American Brass Company. The changes are to enable the company to expedite the work on the big government contracts. The machinery for sawing of brass and bronze metal to order which was located for more than 10 years in a large section of the upper story of the press department, has been transferred to another section of the factory, giving space to be utilized by a large corps of inspectors.

According to articles of association recently filed, the gift to the town of Torrington, of the property on Litchfield street, between Wilson Avenue and the railroad, by Charles F. Brooker, president of the American Brass Company, in memory of his mother, is to be known as The Maria Seymour Brooker Memorial, Inc. The incorporation will be under the general laws of the state regulating the formation and organization of corporations without capital stock. As to the purposes of the memorial, the charter states:

"The said corporation is formed to continue and perpetuate the work of benevolence, aid, charity and education to which Maria Seymour Brooker of Torrington, Conn., was devoted throughout her life; and the chief purposes of the corporation are fourfold, namely, the establishment and maintenance in Torrington of a day nursery, a nurses' home and headquarters, an administration building and visiting nurses' headquarters."

The property which comprises Mr. Brooker's gift is valued at $35,000 and when proposed improvements are completed it will have a value of about $50,000.—J. H. T.

NEW BRITAIN, CONN.

JUNE 10, 1918.

Labor circles in New Britain, as throughout the state, are generally tranquil this spring. The scale of wages was never higher, and demand for skilled and unskilled workers was never greater. The present situation, as excellent as it is, gives every indication of continuing throughout the summer. Government orders continue to arrive and only today the ordnance department authorized sizable contracts with the North & Judd Manufacturing Company for barrel roller buckels and with the Landers, Frary & Clark Company for packing knives and scabbards.

The Russell & Erwin Division of the American Hardware Corporation is now going at maximum efficiency and beginning Monday, May 27, its output of trench mortar shells totals 5,000 per day and this speed will be maintained until the Government order for 500,000 has been filled. This order is one of the big ones that has come to this city and has necessitated the addition of a large addition to the factory hands. It has likewise made it imperative that the firm temporarily abandon a great portion of its lock manufacturing features. Already about one-half of this plant is devoted to Government work. Machines that were formerly used for the regular lines of work are now used exclusively for the production of shells, and other machines are practically idle because of no men to operate them. These shells, which are fired from a trench mortar, are made entirely at the R. & E. Company, then sent to another city, where they are loaded with high explosives and shipped overseas.

The P. & F. Corbin Division of the American Hardware Corporation is doing its share of war work and is turning out vast quantities of hand grenades, while the various other concerns about the city, including the smaller moulding shops, etc., are getting their share of sub-contracts. The Stanley Works is so rushed with business that more office room has become immediately imperative. The company has therefore decided to take over a private dwelling, adjacent to its present office, which is to be used for the overflow office work. Business at the Union Manufacturing Company, Traut & Hine, Skinner Chuck, Corbin Screw Corporations and others is also of the best.

As heretofore, the New Britain Machine Company probably leads as New Britain's war baby. Going at top speed day and night it is unable to keep abreast of its Government orders and the new factory building, just completed, does not meet the requirements. The directors of this concern, at a recent meeting, have voted to increase the company's capitalization $250,000, to be issued to stockholders of record on May 10 at par, $25. The

new capitalization will be $1,500,000, and the issue will be payable July 3. The directors have also authorized the Aberthaw Construction Company of Boston to erect a new factory building for them in the southern section of the city. The new building to be erected is to be part steel and part brick and will measure 340 x 141 and is to be one story high. This new building is to be used for the production of certain kinds of steel work, and its shipments will be greatly facilitated because of the excellent railroad frontage.—H. R. J.

PROVIDENCE, R. I.

JUNE 10, 1918.

With practically all of the manufacturing establishments of Rhode Island, especially those engaged in any of the various lines of the metal trades, working on Government orders, the civilian trade has shown a marked falling off, it is claimed during the last few months. Many of the managers of these plants believe that with the Government placing new orders regularly and in increasing volume, it is only a question of time when the non-essential industries will be shut down to enable the concerns working on Government products to obtain more skilled labor for the plants turning out supplies and munitions for the Government.

The labor situation is still causing the manufacturers a great amount of worry and it is feared that the coming drafts will take a large number of employes from the various manufacturing plants, which will necessitate these plants further curtailing on their civilian orders. Business generally remains good in all lines of the metal trades represented throughout the State and the majority of the plants have orders ahead to insure their operation to capacity for some time to come, while, in many of the plants new orders are constantly piling up.

The second Red Cross campaign in this State was successful beyond the most sanguine expectations of any of the workers in its behalf. Rhode Island had an allottment of $850,000, while that for the city of Providence was $600,000. The returns at the close of the drive showed $1,144,812 to the credit of the State and $722,562 to the city. While no separate account was kept of the different industries, it is known that the various branches of the metal trades responded with the same generous liberality that has characterized them in all previous patriotic, philanthropic and charitable drives for funds. Among the larger contributions reported were the following: Samuel M. Nicholson, $10,000; Henry D. Sharpe, $10,000; Gorham Manufacturing Company, $7,500; Ellen D. Sharpe, $5,000; D. & W. Fuse Company, $2,000; Nicholson File Company employes, $1,093; employes of Brown & Sharpe Manufacturing Company, $6,000; Belcher & Loomis Company, $1,000; Rhode Island Tool Company, $1,000; William A. Viall, $5,000; American Screw Company, $10,000; American Emery Wheel Works, $1,000. William A. Viall, secretary of the Brown & Sharpe Manufacturing Company, was state chairman for the drive.

A permit has been granted to the American Emery Wheel Works to erect another story to its brick manufacturing plant on Pitman street. The addition will be 32 by 85 feet with a flat, tar and gravel roof.

Seven of the departments at the Brown & Sharpe Manufacturing Company were credited with 100 per cent of its personnel as subscribing for the Third Liberty Loan bonds. Two silk banners offered by the corporation in the competition for bond subscriptions among the various departments of the concern were presented at an outdoor noonday meeting a few days after the campaign finished. One flag was for the departments having more than 75 employes, and was taken by the Hardening Department, W. A. Henry, foreman; while the other, for the department of less than that number of employes, went to the Electrical Department, William McClanachan, foreman. In making the awards, account was taken of the number of subscribers in proportion to the number employed; of the amount subscribed in proportion to the wages paid, and of the number employed in each department.

The prizes were presented by Henry D. Sharpe, treasurer of the corporation, who congratulated the men on their subscriptions to the three loans, which he summarized as follows: First Liberty Loan, 1,853 subscribers, $118,600; Second Liberty Loan, 4,542 subscribers, $262,050; Third Liberty Loan, 5,510 subscribers, $322,150.

The affairs of the Metal Products Corporation of this city, which went into the hands of receivers last September, are nearing a settlement that is satisfactory to the creditors and stockholders, inasmuch as the creditors are being paid in full while there will be a substantial balance to be divided between the stockholders. The receivers have paid off 60 per cent of the claims of the creditors and the 40 per cent remaining will be paid in a short time.

Acting under authority from the court the receivers called for bids for all the personal property of the concern, excepting the cash in hand and accounts receivable, and the property was disposed of to the E. A. Eddy Machinery Company, of this city, for $51,250. The principal stockholders of the Metal Products Corporation were: George Briggs, Jr., Arthur Stone and Harry M. Mays, but these will now cease their connections therewith, and Messrs. Briggs and Mays will devote their interests and activities to the Screw Machine Products Corporation. Mr. Eddy has announced that he will for the present continue the operation of the Metal Products plant.

The capital stock of the J. H. Higgins Company, 198 Globe street, this city, dealers in machinery and all kinds of metals, has been increased from $12,000 to $35,000, according to information filed at the office of the Secretary of State.

A number of additional contracts have been awarded recently by the Ordnance Department of the United States Army to Rhode Island concerns, including bushings to Brown & Sharpe Manufacturing Company; adapter plugs to the Ostby & Barton Company, and checks to the Jewelers' Products Corporation.

A permit has been granted to the Brown & Sharpe Manufacturing Company to erect a one-story brick addition, 62 by 187 feet, to its storehouse on the north side of Promenade street.

The Owren Foundry Company, which makes brass, bronze and aluminum castings for jewelers, is removing its plant from 311 Eddy street, Providence, to 80 Union street, Attleboro, Mass., where it will continue business under the name of the Owren Casting Company. W. H. M.

ROCHESTER, N. Y.

JUNE 10, 1918.

The beginning of summer finds industrial life of this city driving ahead at full force. Never before in the history of Rochester have the manufacturing plants here been so crowded with business. While it is true that many of the larger institutions are turning out war material, rush-order conditions apparently prevail in every plant of moment throughout the city and its immediate suburbs.

Wages have gone to such a high plane that other industries are suffering from a lack of help. The munition plants, the big, new addition to the Bausch & Lomb optical works and the shell factories have attracted hundreds of able-bodied workers from other lines of occupation, to the great detriment and disadvantage of the latter.

Still there is little complaint heard, from the fact that the large proportion of the workers have gone to plants making war materials, which is looked upon as a national necessity at this time. The enthusiasm with which the laboring classes have taken hold of the situation is shown by the manner in which the recent War Chest campaign was carried to a successful conclusion. Of the $5,000,000 raised by subscription, the laboring element turned in more by far than their actual proportion of the total sum. In some manufactories the money contributed was more than 100 per cent. of the amount allotted to the individual plant. The Red Cross gets more than four-fifths of the total sum realized.

The railroad situation is again the troubling problem to local manufacturers. The outgoing traffic is handled much more rapidly and promptly than incoming shipping. Materials for the making of war munitions are given preference in the incoming traffic, while the finished product goes out without much delay. But this condition apparently prevails the country over, manufacturers realize.

The demand for brass and copper in Rochester at this time is very strong, and prices have somewhat stiffened. Yellow brass rods and tubing are quoted at from 24¼ cents to 24¾

cents, the former being an "inside" price figure and not readily obtainable at this time. One local plant filed an order yesterday for 150,000 pounds of brass at the lower figure.

The aluminum situation has greatly improved of late. The metal is now obtainable in ingot form. Last week ingots were to be had at 32½ cents, but through Governmental operation that figure has been increased ½ cent. The free movement of aluminum will be of vast benefit to the local industrial situation.

While red brass is not quoted in Rochester, it may be interesting to learn that much of it is being turned out in furnaces attached to several of the larger manufacturing plants. The output of the Bausch & Lomb plant's foundry has been doubled since last fall.

Scrap brass is weak, brass turnings or chips being quoted at 12¾ cents.

The demand for zinc is very heavy at present, and the supply is fairly good. Grade A is quoted at 12 cents flat.

Lead is in strong demand, trust prices prevailing always.

More than 5,200 men and women are now employed in the Bausch & Lomb plant, the bulk being employed on war work. Several floors of the main building are occupied exclusively by women and girls. Many of the latter left such occupations as telephone exchanges, restaurants, clothing factories and clerkships. They have proved to be adept at the work assigned to them and are pleased because of the change they made. The war munition plant is practically in full operation at this time, about 500 men occupying the building. The force will grow as each department increases its productiveness.—G. B. E.

MONTREAL, CANADA

JUNE 10, 1918.

With practically every manufacturing plant in this territory running to the full limit business conditions are good and concerns are receiving plenty of new business with enough orders ahead to insure running to capacity for several months.

The entire Jenkins Manufacturing Company, Limited, Canadian plant located on St. Remi street, is operating a day and night force on its regular line of brass valves and marine work in which it is now specializing and making large quantities of this class of brass and iron goods, comprising manifolds, stop and check valves, salimeter and pressure gauge cocks which are being installed on ships now under construction or completed all over the Dominion.

The contract for the construction of a nickel and copper refining plant at Deschenes, Quebec, for the British-American Nickel Corporation has been let this month and calls for its completion before the snow falls. The buildings and machinery will cost over a million dollars.

It is understood that British and Norwegian interests are back of the scheme. The production of refined metal from the completed plant will be very large and on a scale hitherto unknown in Canada.

The plant will be modern in every respect and its annual production of finished metal will be large. Just how large officials of the company decline to intimate. An unlimited supply of power from hydro-electric energy developed from rapids on the Ottawa river will be obtained and conditions in this respect will result in low operating costs.—P. W. B.

DETROIT, MICH.

JUNE 10, 1918.

The brass, copper and aluminum plants in Detroit have come through loyally in the recent Red Cross fund campaign. The city's quota of $10,000,000 was raised in a few days, employees as well as employers giving liberally and without the least hesitation.

Persons having charge of the campaigns have found that each time appeals are made that it becomes easier to obtain subscriptions. The metal trades have done their share loyally in all appeals for funds and in the purchase of Liberty Bonds.

The draft calls are having serious effect on the metal plants where large numbers of skilled men are employed. About 50,000 men from Detroit already have gone into the army and manufacturers now are starting to train women to take their places. Every brass, copper and aluminum plant in the city is rushed with work and men are needed. The highest scale of wages is paid here.

The automobile plants are concentrating their attention now on the production of munitions, airplane motors and trucks for the Government. The output of pleasure cars has been curtailed to a large extent.

The shipbuilding companies where large plating and brass plants are maintained, have recently received another large order for ocean-going ships. Many have already been completed and are now on the Atlantic. These plants also report a shortage of men.

It is reported that the Roe Stevens Manufacturing Company has changed its name to the Scott Valve Manufacturing Company of Michigan. It is said the Roe Stevens Manufacturing Company's charter had run out and before re-incorporating it was decided to change the name to Scott Valve Company. This company manufactures Scott's high grade valves. Among the specialties are gate valve, globe valve, safety valve, steam radiator valve, extra heavy and a number of others. The company also is producing bronze and brass castings.

The automobile industry in Detroit is said to have used in 1917 approximately 3,000 tons of tin, principally for babbit and for soldering. Two and one-half pounds of solder alone are used in a Ford radiator. The Dodge radiator uses two and three-fourths pounds. It is said the truck companies alone used 275,000 pounds in 1917.

Perfect harmony exists in Detroit between labor and capital. No strikes are on and production is moving evenly with the exception of the handicaps due to shortage of men.

Transportation facilities have improved due to opening up of lake navigation. Coal, however, is not coming in as freely as desired and a shortage is looked for later in the season.—F. J. H.

CINCINNATI, OHIO

JUNE 10, 1918.

Like the rest of the population, members of the machine tool foundry and allied trades have been warmly engaged during the past month in doing their share to make the Liberty Loan and Red Cross campaigns a success; and they may consequently claim their share of the credit for putting Cincinnati "over the top" in both directions. The city oversubscribed its quota of the Third Loan, $20,000,000, by about 75 per cent., turning in subscriptions of $35,000,000 or more. Every shop in the city, from the largest machine tool concern to the smallest foundry, made a substantial purchase of the bonds, according to its ability, and employes were equally patriotic, many shops turning in subscriptions from every employe. The success of the loan, as far as Cincinnati is concerned, was due to complete co-operation on the part of all elements of the population. The same can be said of the generosity with which the city met the needs of the Red Cross in the campaign for the second war fund of the great relief organization. The amount asked of Cincinnati was $1,250,000. This was raised in three days, and thereafter the efforts of the workers were devoted to accumulating a handsome surplus to form a "War Chest" from which to meet the requirements of other war relief organizations for the year. The manner in which this was done may be gathered from the fact that a total of nearly $2,500,000 was raised before the drive was over. Many of the big machine tool manufacturers made repeated gifts, doubling and trebling their initial subscriptions; and the competition to secure the coveted 100 per cent. rating, by turning in complete lists of employes, with not one missing from the list of contributors, brought nearly every concern in the metal trade into this select classification. Several instances were reported of hot indignation on the part of the men against an unpatriotic or pro-German fellow worker who refused to contribute, thereby preventing them from attaining the 100 per cent. record, and in one or two cases it was found necessary to discharge recalcitrants of this sort in order to satisfy the bulk of the force. That is the sort of Americanism found in Cincinnati shops today.

The urgent need for labor among tool manufacturers in Cincinnati, made the more emphatic by the recent departure of another large draft contingent, may be somewhat relieved by the operation of the "work or fight" ruling announced by the

federal authorities. The estimate of the number of men who will be affected in Cincinnati by this ruling runs into the thousands, and as the natural tendency of men in occupations deemed non-essential will be to secure preferred employment at home, the shops may expect to receive a large number of applications from unskilled workers in the period before the new ruling takes effect. It is taken as certain that the makers of tools, of castings, and so forth, all of which are essential to the production of munitions, will be placed high on the list of exempted occupations, so that they will lose no men by the operation of the new ruling, and will gain thousands. For this reason the metal trades will welcome heartily the expected accessions to the ranks of their workers, and will probably afford a striking example of the practical utility of the Government's policy in this respect.

The Warman & Wolf Aluminum Foundry Company has leased a plant in Norwood, a Cincinnati suburb, formerly occupied by the National Enameling Company, and after such changes as are necessary have been made, will occupy it, moving from its present location on Central avenue. The need for more space was emphasized by the fact that the company has been awarded a large Government contract for castings, including aluminum, brass and bronze, and Messrs. Warman and Lichtenauer, who operate the company, therefore took action promptly to meet the situation.

Coppersmiths in five large Cincinnati copper plants, after a strike for higher pay lasting for several days, and accompanied by some violence, were granted an increase of 20 cents an hour, with double pay for overtime. In one instance, where strikers were presented in police court on charges of assaulting workers, the court expressed very decided opinions in the matter of strikers and violence under present conditions, especially in trades connected with war work, saying: "Any attempt to impede Government work now is, in my opinion, very close to treason, and will not be tolerated. At this time, when the Government is working night and day, it is the duty of every citizen to help, and this must be done."

Brass foundry workers in Cincinnati have also been granted an increase in wages of $1.25 a day. Although some concerns in the brass and copper trades have been unable to grant the new scale, workers in Cincinnati shops are now very generally satisfied with the conditions under which they are working, and operations during the summer are not expected to be further interrupted by labor troubles.—K. C. C.

COLUMBUS, OHIO

JUNE 10, 1918.

The metal market in Columbus and Central Ohio territory has ruled firm during the past month. The volume of business is good and the demand for all metals remains steady. Tin is slightly off and with that exception all metals are holding up well at former levels. Prospects are for a continuation of the strength shown on all sides.

Brass is one of the strongest points in the market and the demand is good. The copper demand is also good, as is aluminum. Zinc is holding up well at former levels. There is a strong demand for babbitt and type metals which are holding up well at the higher levels. Available supplies in this section are fairly good. Shipments of metals are now coming out better with a slight improvement in transportation facilities.

Metal using concerns are looking forward to some stocking of brass and copper in addition to other metals. In fact, there is a distinct movement in this section to stock up to guard against an emergency, but shipments are mostly for current needs and stocks is attended with difficulty.

The last draft call which was issued recently will take quite a number of the young men employed in metal using shops in Columbus. In fact, the detail of 535 men which left Columbus, May 28, for Camp Sherman, contained quite a few mechanics and metal workers. Others are expected to be called soon and this is causing considerable concern among the managers. The labor shortage is becoming more and more pronounced.

As Columbus filled its war community chest with about $3,500,000 early in the year, there was no Red Cross drive in the Buckeye capital at this time. The quota from Columbus which was slightly over $300,000 was simply taken out of the War Chest and placed to the credit of the Red Cross. There was no special solicitation outside of a benefit performance given at a local theatre.

J. W. L.

CLEVELAND, OHIO

JUNE 10, 1918.

Three important factors affecting the metal industry of Cleveland and the entire Northern Ohio manufacturing district have developed during the last few weeks. Foremost among them is the extensive shipbuilding program outlined by Director Charles M. Schwab while here this last month. The others are the uniting of all manufacturers to facilitate the production of materials for war and the bid of Cleveland for a mammoth gun plant.

Of chief significance to the metal industry in the Schwab shipbuilding program is the fact that many yards here and along the Great Lakes will be greatly enlarged, as well as to require a tremendous amount of material. The extent of this operation is summed up in the agreement of Mr. Schwab with managers of shipyards on the Great Lakes for the building of 130 ships, of 4,200 tons each next year, as part of the additional 10,000,000 tons of ships he wants lake shipyards to produce in 1919. The total cost of this part of the project will be $100,000,000. Millions must be spent in expansions and additions to plants affected.

This work, according to present plans, has been distributed among the American Shipbuilding Company, which will produce 60 of the boats in Cleveland, Detroit, Superior, South Chicago, Lorain and Buffalo yards; the Manitowoc Ship Building Company, which gets 12; the Toledo Ship Building Company; the Saginaw Ship Building Company; the McDougall Duluth Ship Building Company, and the Globe Ship Building Company. The American Ship Building Company here announced it has in all contracts for 126 ships.

The War Industries Commission of the Cleveland District is the name of the newest organization created to facilitate production for the country's war needs. It represents 150 manufacturers who formed the group at a special meeting at Chamber of Commerce Hall. Factories in 53 Northern Ohio counties, and in Erie, Crawford and Mercer counties in Western Pennsylvania are affected. The move is the outcome of the Government reside to get 100 per cent. efficiency out of small plants, as well as the large. A moving spirit in the plan is Samuel Scovil, who is chief of the ordnance bureau for this district. The plan will permit conduct of all business on a uniformly fair basis for each manufacturer. This will be of great benefit to the small manufacturer, for he will be permitted to consider all Government contracts for war material that he can produce, as well as the larger interests. There will be eight divisions in the district, in each of which a branch office will be conducted. Main offices will be in Cleveland. Through these offices what the Government wants and how the producers can supply it will be handled. Among the classifications affecting the metal industry are automotive, castings, machinery and machine products, forgings and stampings. Members of the executive committee and their locations are: R. T. Skinner, Toledo; W. D. Bradley, Lima; W. A. Jones, Columbus; H. S. Goeman, Mansfield; C. L. Eshleman, Canton; J. H. Foster, Cleveland, and O. G. Hitchcock, Erie.

The Cleveland Brass & Copper Mills, Inc., is the first plant of its kind here to install a private transportation system for the benefit of its employes. A set of motor trucks with trailers, larger than but not unlike the fire patrols of other days, meet the men at certain points and bring them to the factory. Men completing their work are taken back to these points. The reason for the move is that local street car lines are being severely taxed to bring workers to their tasks promptly and on time. Where plants are running day and night it is essential that when the night shift is ready to quit that the day shift be there on time to take up the work. This means, in many cases in Cleveland, that thousands of workers must gather at a certain point in a short space of time. The overcrowding of cars generally results in delayed arrival of the workers. Through this new plan the workers ride to a convenient point on the street cars, are met by the trucks, and taken to the doors of the plants. The same trucks bring the quitting shift back to the cars. The innovation by the Cleveland Brass & Copper Mills, Inc., is being followed out on a similar scale by plants in other lines of en-

deavor. The Aetna Brass Manufacturing Company has taken possession of property on East 55th street, formerly occupied by the Buckeye Furnace Company. Buildings on the property will be remodeled to make for larger factory space and offices.

In order to obtain additional storage space, the National Bronze Aluminum Foundry Company has purchased a tract of land adpoining its foundry.

The Grabler Manufacturing Company is erecting a new plant, 340 x 60 feet, at its Broadway establishment. The cost of the project will be about $30,000.

In the belief that the purchaser of Liberty Bonds or Thrift Stamps is a better worker, the Cleveland Hardware Company is requiring such activities on the part of its employes. "No Bond —No Man," is the slogan of the plant now. "The fellow who doesn't buy them isn't much of a man," says T. R. Matthews, of the company, "and we prefer men in our plant."—C. C. C.

LOUISVILLE, KY.

JUNE 10, 1918.

Conditions in Louisville have shown material improvement during the past month or two, and practically all of the coppersmiths and soft metal workers are busy, and expect to be busy for several months to come on either direct or indirect Government work. For a time it looked as though the copperworkers of the city would have a hard time surviving when the distillers were closed, cutting off the principal source of revenue to local concerns, but war orders have more than made up for this loss, and again war orders represent steady business whereas distillery business formerly came in spurts during active distilling seasons.

The Louisville metal working trade has not been very hard hit as yet by the draft. There are two or more reasons for this, one being that most of the trained men are older men who are not affected, while, on the other hand, the shops are handling so much Government work that the younger men have been exempted in many cases, and losses to the draft have been very small.

Louisville showed her patriotism this year in both the spring Liberty Loan Drive and the Red Cross Drive. In the Liberty Loan the city far oversubscribed her allotment, as did also the state. In the Red Cross campaign for $320,000, this amount was oversubscribed by more than $250,000. Several of the large metal working plants contributed freely, while at the Vendome Copper Works and one or two other plants almost every man was enrolled in the Red Cross Drive.

The Vendome Copper & Brass Works has secured a big Government contract which will keep that company busy for some months to come, this contract calling for the copper work for 100 submarine chasers, and representing one of the best copper war orders placed in this entire section.

Matt Corcoran & Company and Ahlers & Gregoire Company, both have Government work of one sort or another in hand, the latter concern also having some nice orders for milk condensing machinery made of heavy sheet copper.

The demand for copper and brass has been very heavy for some weeks past, and individuals who have no war orders are having trouble in securing material. Stocks in the jobbers' hands are subject to call for Government use, while about eighty per cent. of the output of the manufacturing mills is being taken up by Government contractors. Sheet copper advanced a half cent per pound during the month, base sheets being quoted at 32½ cents, with copper rods at the same price. Getting material has been a serious proposition for some time past for the concerns which have no war orders on hand.

Matt Corcoran & Company, of Louisville, recently purchased the plant of the Kentucky Peerless Distillery Company, at Henderson, Ky., in order to secure the old copper for use in the company's local shops. The plant was sold for $26,000, including building, grounds, machinery, etc.

There has been a shortage of brass finishers for some time past, resulting in the Hart Manufacturing Company, Ahlers & Gregoire, the Standard Sanitary Manufacturing Company, and other concerns being forced to do considerable advertising for finishers.

The Standard Sanitary Manufacturing Company, of Pittsburgh, operating the A. & O. plant at Louisville, has announced that it is transferring its entire brass foundry department of the Pittsburgh plant to the Louisville plant which for several years has operated a considerable brass plant. Fourteen cars of machinery have been shipped to Louisville for installation in a new brick building that is being put up for the purpose. The old plant at Pittsburgh is being utilized for manufacturing 155 millimeter brass shells for the army, and employes formerly connected with the brass foundry have been retained at the Pittsburgh plant, there having formerly been about 250 men in the department. This will represent one of the largest brass plants in the South when it is completed.—O. V. N. S.

PHILADELPHIA, PA.

JUNE 10, 1918.

Following the announcement that copper prices had been continued by the Government at the old price of 23½ cents for at least seventy-five days after May 31, trade in copper became quieter, although the demand for commercial purposes is fair. Prior to the announcement there had been considerable unrest as to what action the Government would take after the time previously fixed for the old price to elapse. The demand for copper, except for Government work, is light, but deliveries are such as to meet the demand. The trade believes that the Government demands will be exceedingly heavy and they feel that there will be virtually no surplus for commercial needs. They do not believe that there will be a shortage, and that with the demand continuing as it is there will be no trouble in the distribution to meet requirements.

Trade in lead was fair toward the close of the month and prices were reported as holding firm. Stocks are reported as not accumulating and there is no inclination upon the part of sellers to force a market. In spelter little activity was noticeable and prices were reported as unchanged.

A contract was awarded during the month by the Reid Metal Refining Company for the building of an addition to their factory at Tulip street and Erie avenue. It will be 48 x 100 feet and will cost $6,000.

The Fairmount Foundry Company, Mascher and Duncannon streets, is to erect a one-story addition, 22 x 100 feet, to their plant.

Work has been commenced by the American Bronze Corporation, Berwyn, Pa., upon the erection of a one-story foundry addition, 80 x 130 feet, at a cost of $20,000.

The John T. Lewis & Brothers' Company, 705 Lafayette Building, refiners of soft metal, residues and drosses, is erecting a furnace works, 20 x 50 feet, and a three-story oxide plant to cost $150,000.

Announcement is made by the William Cramp Ship & Engine Building Company that they will soon begin the erection of a brass foundry near their plant at Beach and Ball streets.

Louis Mink, formerly of Mink & Roberts, and lately with the Queen Metal & Rubber Company, has purchased property with a one-story building at Eighteenth and Washington avenues. At that place he will conduct a plant for the smelting and refining of white metals, drosses and skimmings under the name of the Mink Refining & Smelting Company. The plant will be thoroughly equipped with modern type furnaces and other apparatus. The building has a floor space of 7,000 square feet, with a railroad siding which connects with the Belt Line which will give facilities for shipment over all railroads.

The increase in freight rates announced by Director-General of Railroads McAdoo on May 27, while causing much discussion among the trades, it was nevertheless expected that an advance in rates would occur. In speaking of the advances, Powell Evans, of Merchant & Evans, large metal dealers, 2035 Washington avenue, said: "I believe that the railroads have a right to charge enough for freight and passenger service to make them pay, and this they have not done for ten years. We cannot carry on the war successfully unless we have good transportation facilities, and in order to have adequate transportation the roads must be on a paying basis. The increase of 25 per cent. will bring the rates to no higher level than the railroads have a right to charge."

Little improvement is shown in the tin situation and offerings in the market are not of large tonnages. The trade states that they do not believe that the improved condition in the shipping situation from the Far East will result in larger supplies for at least two months.

As a result of their subscriptions to the Third Liberty Loan several metal firms of this city have received honor flags. Among the large subscriptions were: The Ajax Metal Company and 100 per cent. of their employes, $50,000; The U. T. Hungerford Brass & Copper Company, $25,000; Merchant & Evans, $10,000; American Engineering Company and employes, $102,000, and the Southwark Foundry Company, with 550 employes, $66,000.

The "work or fight" order of Provost Marshal Crowder to men of draft ages who are engaged in non-essential employment is expected by the men in the metal trade in this city to have an important effect on the solution of the labor problem. For many months the labor question has been causing considerable concern to the various trades and as many of the metal firms are engaged in work for the Government it is believed that they will be given a supply of labor before the order becomes effective and if not before after July 1, when the order goes into effect.

The order of the Government it is believed will put a stop to "vacations" of men in draft ages, and it is expected that the example will be followed by older men who have earned good money and who intend to spend several weeks in pleasure. The outlook for an adequate supply of labor looks good, and, in fact, better than was apparent for many months. At the Newton Machine Tool Works, 23rd and Vine streets, they were elated with the "work or fight" order and expressed an opinion that they will soon be able to fill in the gaps in labor that were made by men seeking more lucrative employment or by those who had been called into service. This firm has considerable Government orders upon their books. The effect of the order is also expected to prove of good advantage to the Quaker Tool Works, Boudinot and Westmoreland streets, who have large Government orders for trench mortars and dies.

Philadelphia is devoting her efforts toward raising funds for the War Chest. The United States Government has selected certain national agencies as best fitted to carry on war relief work, and each will have a separate board to direct the distribution of funds. Funds contributed to the War Chest will be devoted to the relief work carried on by the American Red Cross, which has its National War Council; the Y. M. C. A., its National War Council; the Knights of Columbus, its Training Camp Commission; the Y. W. C. A., its National War Work Council, and the Young Men's Hebrew Association, its War Relief Board, and this district includes five counties, Philadelphia, Bucks, Delaware, Chester and Montgomery, which will share in the contributions. The War Welfare Council has charge of the War Chest funds, and in the contributions that they have received the metal trades have gone "over the top" and many large firms, with their employes, have attained places upon the honor roll.

Among the contributors among the metal trades in this city are: Ajax Metal Company, 46 Richmond street, $10,000; Hess Bright Manufacturing Company, Front and Erie avenue, $2,500; John T. Lewis & Bros.' Company, Lafayette Building, with 131 employes, $2,750; Enterprise Manufacturing Company, Third and Dauphin streets, with employes, $9,300; McCaffrey File Company, with 81 employes, $1,227; American Manganese Manufacturing Company, $6,000; William Sellers & Company, 16th and Hamilton streets, $6,000; Newton Machine Tool Works, 23rd and Vine streets, $2,400.—F. W. C.

TRENTON, N. J.

JUNE 10, 1918.

Two of the big Trenton plants were affected by strikes during the past month. The Trenton Smelting & Refining Company's East Trenton plant was the most seriously affected of the two, when eighty of the employes walked out for an increase in pay. But conditions have improved now, and the plant is running to full capacity again. The eighty men asked the company for an increase of 10 per cent. and the employes were informed through a committee that the raise would not be granted. The fourscore men then declared a strike, but the strike soon began to weaken and gradually many of the strikers began to return to work under the old scale, while others sought positions elsewhere. The concern soon secured additional hands to take the places of the strikers. The work is very hard and the men are paid good wages, but they claim that they are entitled to more money at this time. They say they are compelled to work from eleven to thirteen hours a day instead of eight, as was promised. The concern is very busy at the present time and is working on Government orders. One of the demands made by the men was time and a half for all time over eight hours until the company placed three shifts at work. The other Trenton plant of the smelting company was not affected by the strike.

Three hundred employes of the John A. Roebling's Sons Company went on strike because the company refused an increase in pay. The men wanted a 10 per cent. increase and the company replied that it would place them on piece work. This proved unsatisfactory, and the strike was continued. The strikers claim that the wage scale was too low for working on machines, while the firm claimed that the men on the night shift had things easy and frequently went to sleep instead of watching the machines. The strike was in progress for several days when the concern sent for the 300 strikers, and after paying them off, informed them that they were discharged. The strikers soon secured employment at the shipyards near here.

Another serious trouble in the metal plants during the month was the threats made to alleged pro-German workmen who refused to purchase Liberty Bonds. The principal trouble of this kind occurred at the Mott plant, where the brassworkers threatened to throw one man into the canal because he said he did not have to buy Government bonds. A rope was tied around his body and he was taken from the plant to the canal bank when Oliver O. Bowman, president of the Mott company, interfered and prevented the men from putting their threats into execution. The workmen wanted to make the plant a 100 per cent. Liberty Loan organization and did not want one man to spoil the plans. Another Mott employe was threatened with a rope around his neck and given until a certain time to buy a bond, when he finally consented.

The Central Stamping Company, 605-9 Ferry street, Newark, has taken out a permit for the erection of a one-story building, 140 x 250 feet in size, to be used as an enameling shop. The new structure will cost $50,000.

The Pittsburgh Metal Brazing Company, with offices at 417 Market street, Camden, N. J., has filed a certificate of dissolution with the Secretary of State.

The Lincoln Tool & Die Company, of Arlington, N. J., has been incorporated with $20,000 capital to manufacture metal goods. The incorporators are A. M. Gillen, J. S. Gillen and Jessie Gillen, all of Arlington.

C. A. Goldsmith has taken out a permit for a one-story building, 150 x 50 feet in size, to be used as a brass foundry. The structure will cost $24,000.

The Armored Bronze Company, Inc., of Westfield, N. J., has been incorporated with $100,000 capital stock under the laws of New Jersey to manufacture and deal in metallized products. The incorporators are Nathaliel Thompson, N. V. Abraham and W. H. Jeffers, all of New York.—C. A. L.

REFINED COPPER IN 1917

According to B. S. Butler, of the United States Geological Survey, in a pamphlet just issued, the total production of new refined copper in 1917 was 2,428,000,000 pounds, an increase of 169,000,000 pounds over that of 1916.

PRIMARY AND SECONDARY COPPER PRODUCED BY REGULAR REFINING PLANTS AND IMPORTED IN 1913, 1914, 1915, 1916 AND 1917, IN POUNDS.

	1915.	1916.	1917.
Primary:			
Domestic—			
Electrolytic	*1,114,345,342	*1,579,620,513	*1,452,744,593
Lake	†236,757,062	269,794,531	268,508,091
Casting	21,555,129	12,469,050	69,916,911
Pig and best select	15,047,990	26,868,105	82,376,576
	*1,387,705,523	*1,888,752,199	*1,873,546,171
Foreign (electrolytic)	*246,498,925	*370,635,116	*‡555,000,000
	1,634,204,448	2,259,387,315	2,428,546,171
Secondary:			
Electrolytic	38,156,789	78,585,296	66,337,771
Casting	21,417,901	25,838,511	12,779,125
	59,574,690	104,423,807	79,116,896
Total output	1,693,779,138	2,363,811,122	2,507,663,967

VERIFIED NEWS OF THE METAL INDUSTRY GATHERED FROM SCATTERED SOURCES

The Copper Products Company, South Middleton, Mass., reports that the published news item that their plant had been destroyed by fire to an extent of $50,000 is incorrect.

The Aluminum Castings Company, Detroit, Mich., is erecting a one-story brick and fireproof acetylene gas plant at its factory on Dunn Road and Joseph Campau avenue.

The Dayton Brass Castings Company, Dayton, Ohio., has completed the erection of a new and up-to-date foundry at a cost of $12,000. The new foundry will be equipped with the latest foundry apparatus.

The Stamford Rolling Mill Corporation Stamford, Conn., has adopted a new plan of wage payment based on an eight-hour day, and time and a half for overtime. This amounts to an increase of practically ten per cent.

The American Reclaiming and Refining Company, recently incorporated, is progressing with its plant at Kenilworth, N. J., and its first cupola has been set up. The company aims to handle sheet metal, scrap recovering the plating metals and casting the iron.

The Two Rivers Plating & Manufacturing Company, Two Rivers, Wis., is constructing a new one-story 60 x 70 feet steel and concrete addition. The company is increasing the manufacturing end of its business and is installing new die making machinery.

The Wheeler Condenser and Engineering Company, Carteret, N. J., are contemplating extensive additions to their brass tube mill for the manufacture of condenser tubes. Their existing mill, recently completed, was described in the May issue of THE METAL INDUSTRY.

The Die Casting Company, 16 Washington avenue, Irvington, N. J., is building an addition and making alterations to its two-story factory. The company operates an aluminum foundry, tool room, aluminum and white metal die casting department and casting shop.

The Reliable Stamping Company, Buffalo, N. Y., is now engaged in the completion of a new factory, located at 1392 Niagara street, which has been necessitated by the continual increased production of its aluminum rule, which is known on the market as the Rustless Rule.

The American Foundry Company, operating a brass, bronze and aluminum foundry, Newark, N. J., has purchased a building on Avon and Springfield avenues and South 10th and 11th streets. The building is 43 x 125 feet and will be used as a brass foundry. This company was reorganized on April 1 and put under the management of R. B. Roberts, Jr.

The Bunting Brass & Bronze Company, Toledo, Ohio, will erect a two-story brick and steel brass foundry, 120 x 175 feet, which it expects to have completed in about the middle of July. The company has received large Government orders for bearings and for bronze and brass machinery parts. The new plant will have a capacity of 40,000 to 50,000 pounds of brass castings per day.

The Corcoran Manufacturing Company, Cincinnati, Ohio, makers of metal specialties, has acquired the plant of the Knabe Brothers Company, in Norwood, which, it is understood, will be used for finishing some Government contracts, and later will be the main manufacturing plant of the company. The company operates a tool room, cutting-up shop, stamping, tinning, soldering and japanning departments.

The Enameling & Stamping Corporation, by W. I. Fickling, announces that it has purchased the plant of the Fickling Enameling Corporation in Long Island City, at 2nd and Webster avenues and that it is now equipped for enameling of every character and in all colors. The capacity has been greatly enlarged and still further additions are being made to ovens and equipment.

The Industrial Foundry & Machine Company, manufacturers of aluminum, brass and bronze castings, Pottstown, Pa., has completed the erection of a new building, 90 x 120 feet, which will be used for machine shop purposes. The building was completed in the record time of 29 days. The company operates a brass, bronze and aluminum foundry, brass machine shop, tool and grinding rooms.

A. D. Jamieson manufacturers' representative, has established headquarters at Washington, D. C., and is prepared to represent manufacturers who desire to secure Government and private orders for their products. Mr. Jamieson has had long experience in manufacturing and selling problems, and has been successful in securing a large amount of business for his clients. He can be reached by addressing P. O. Box 212, New York City.

To meet the constantly increasing demand for its product and particularly to care for the requirements imposed by the war, the **Metal Hose and Tubing Company,** Brooklyn, N. Y., makers of triplex gasoline hose, has started construction on an addition to its plant. The building is of permanent construction in brick. The new space will give 5,000 feet more room for manufacturing purposes and the factory will immediately require all of it.

The National Anode Company, Second street, Passaic, N. J., is working on a Government contract for high conductivity copper castings, the order for which, they state, was secured after exacting Government tests upon samples submitted in competition with various other concerns. The National Anode Company's plant is devoted exclusively to making pure copper castings in the form of anodes for platers, and castings for electrical work.

Widder Bros., manufacturers of dyes, chemicals, etc., 155 Broadway, Brooklyn, N. Y., has acquired the controlling interest in the Arizona Lacquer Manufacturing Company, Inc., whose factory is located at Smith and 9th streets, Brooklyn. The manufacture of lacquers, colors, bronzing liquors, white enamel, etc., will be continued and the main sales office of the Arizona Lacquer Manufacturing Company, will be located at 155 Broadway, Brooklyn.

The H. Mueller Manufacturing Company, Decatur, Ill., is planning further extensive improvements and additions to its plant to enable it to handle munitions orders with greater facility. Estimates as to the cost of the extensions have not yet been reached. The intention is to begin construction without delay. The company recently completed additional buildings and operates a brass foundry, brass machine shop, tool and grinding rooms, galvanizing, plating and polishing departments.

The United States Smelting, Refining and Mining Company, 120 Broadway, New York, has taken over the business formerly done by its subsidiaries, namely, the United States Smelting Company, the Mammoth Copper Mining Company, the Gold Road Mines Company, the Centennial-Eureka Mining Company and the Needles Mining & Smelting Company. The business of selling metals, formerly handled by the New York office of the United States Smelting Company, will be in future carried on by the United States Smelting, Refining & Mining Company at the above address.

Enamels and Japans.—The Moller & Schumann Company, Brooklyn, N. Y., has issued Bulletin No. 1 consisting of twenty pages containing color samples and descriptions of the air drying and baking black enamels and japans manufactured by them. The booklet contains a lustre chart which illustrates the difference of lustre of black japans and enamels, indicated by high gloss, gloss, semi-gloss, rubber and flat. Other bulletins issued by this company are No. 2 Black Enamels and Japans, No. 3 White Enamels, and No. 4 Paste Woodfillers.

The Berry Metal Company, New Brighton, Pa., has been organized and is erecting a new foundry building which will have a capacity of 150,000 pounds of brass, bronze, copper and aluminum castings per month. W. D. Berry, until recently general superintendent of the Keystone Bronze Company, is president and general manager and Walter V. Berry is secretary. The principal products are to be railroad journal bearings, rolling mill bearings, acid metal castings and babbitt metal. Mr. Berry has, for the past thirty years, been connected with some of the largest concerns in the Pittsburgh district and is well known to the trade.

The Crescent Brass Foundry Company, Superior, Wis., has been organized by two expert foundrymen, A. A. Williams, formerly of the Duluth Gas Engine Works, and Gustav B. Erickson, until recently with the Duluth Brass Works, Duluth, Wis., and has established a brass foundry at 1116 North Third street, Superior. The new company will specialize in brass and bronze castings for the shipbuilding trade, and has contracts for practically the entire requirements of the Superior Shipbuilding Company. It also will furnish castings to the Globe Shipbuilding Company, Whitney Brothers, and the McDougal-Duluth Shipbuilding Company. Heretofore Superior shipyards have been dependent upon Duluth and other outside foundries for such castings and supplies. The new company will operate a brass, bronze and aluminum foundry.

ELECTION OF OFFICERS

The stockholders of the **Joseph Dixon Crucible Company,** Jersey City, N. J., have re-elected the following officers: George T. Smith, president; George E. Long, vice-president; J. H. Schermerhorn, vice-president; Harry Dailey, secretary; William Koester, treasurer; Albert Norris, assistant secretary and assistant treasurer.

Driver-Harris Company, Harrison, N. J., announces the election of the following officers: Frank L. Driver, president; Arlington Bensel, first vice-president; Leon O. Hart, second vice-president; Frank L. Driver, Jr., third vice-president; Percival E. Reeves, treasurer; Stanley M. Tracy, assistant treasurer, and M. C. Harris, secretary. Wilbur B. Driver, formerly vice-president, has retired from active participation in the business.

REMOVALS

The American Zinc Products Company, has removed its general and sales offices from Warren, Ohio to Greencastle, Indiana.

The offices of the **Eastern Zinc Company** have been moved from 25 Church street, New York, to 255 Russell street, Brooklyn, N. Y.

The Manufacturers Brush Company, manufacturers of all kinds of polishing and scratch brushes, etc., has moved from 1956 West 45th street to its new and greatly enlarged factory at 1950 West 114th street, Cleveland, Ohio.

The Paul Wenger Company, dealers in metals, ores and chemicals, has moved to 56-58 Liberty street and 35 Nassau street from 100 Broadway, New York. The company will now have larger quarters and increased facilities, and will be in a better position to handle future business.

In order to fill a government contract just awarded for various aluminum, brass and bronze castings on schedule time, the **Warman Aluminum Casting Company** has moved from 41-43 Central avenue to larger quarters at Montgomery and Lexington avenues, Norwood, Cincinnati, Ohio

The Aetna Brass Manufacturing Company, Cleveland, Ohio, has acquired property at 1635 East 55th street, into which it moved its plants from 1390 East 40th street, 3870 3890 Hamilton avenue and 606 East 99th street on June 1. The company operates a brass, bronze and aluminum foundry, brass machine shop, tool and grinding rooms, casting shop, soldering, plating, polishing and lacquering departments.

INCORPORATIONS

Business organizations incorporated recently. In addressing them it is advisable to include also the names of the incorporators and their residence. Particulars of additional incorporations may frequently be found in the "Trade News" columns.

To manufacture metal specialties.—The Cole Metal Products Company, New York, Capital $20,000. Incorporators: M. Levin, H. Vorzimer and L. W. Cohen.

To manufacture imitation gold leaf.—J. Potter & Son, Inc., Richmond Hill, L. I., N. Y. Capital, $15,000. Incorporators:—Justus and Elmer Potter and Hattie Potter. The company is in the market for bronze powder.

To operate a bronze foundry.—The Roman Bronze Works, Greene avenue, Brooklyn, N. Y. Capital $100,000. Incorporators: Riccardo R. Bertelli, president; Celestino Pira, vice-president and Frederick L. Huber, secretary and treasurer.

To operate a brassworks.—A. Kadish & Company, 182 Grand street, Capital $10,000. Incorporators: D. H. Spielman, A. Kadish, and H. A. Bernstine. The company will operate a cutting-up shop, spinning, stamping, soldering and polishing departments.

To manufacture brass, copper, bronze and aluminum castings.—The Dixie Brass & Foundry Company, Birmingham, Ala., has been incorporated to take over the business of the Bruce Pattern and Manufacturing Company, by L. and G. R. Cohn and Charles Wegelin, with a capital stock of $15,000.

To manufacture valves, etc.—The Miller Valve and Brass Company, Macon, Ga. Capital $25,000. Incorporators: Charles T. Miller, T. E. Ryals and J. W. Clisby. To operate a brass, bronze and aluminum foundry, brass machine shop, tool and grinding room, casting shop, spinning, stamping, soldering, plating and polishing departments.

To operate a brass foundry.—The Wayne Brass Foundry Company, Pittsburgh, Pa. Incorporators: W. J. Davis, George F. Godfrey, J. Oscar Noel, and E. J. O'Brien. Capital $50,000. The company has been incorporated to take over the business of the Wayne Brass Foundry Company which was organized in 1907 as a partnership. The business will be conducted under the same management.

To manufacture metal household utensils and kindred products.—The George E. Page Metal Products Company, Rochester, N. Y., Capital $100,000. Incorporators: A. J. Stickney, W. Poppe, and George E. Page. The company operates a tool room and spinning, stamping, and polishing departments and is in the market for power presses, spinning lathes, polishing wheels, belts, pulleys and hangers, etc.

To manufacture bronze and aluminum castings, etc.—The Pro-Econ Foundries, Inc., Lake and Crown streets, Bloomfield, N. J. Capital $25,000. Incorporators: William P. Baerenrodt, and Arthur W. Schuller. The company will operate a brass, bronze and aluminum foundry and grinding room, and states that it is in the market for supplies and equipment from time to time.

PRINTED MATTER

Briquet Ingot.—The Eastern Brass and Ingot Corporation, Waterbury, Conn., has just issued a very interesting booklet in the interest of their product, which is brass briquet ingot. This company receives metal chips, borings, turnings, and other finely divided forms of metal from mills and factories and returns the material in the form of solid blocks or so-called briquet ingots. Among the interesting statements in the booklet is to be found the declaration that during the last twelve months the Waterbury plant alone produced 24,000,000 pounds of these ingots.

Burnishing Process.—The Abbott Ball Company, Hartford, Conn., has issued a new booklet giving description, illustrations and price-lists of burnishing barrels and steel burnishing balls. These machines and materials, which go to make up the Abbott burnishing process for the finishing of metal goods, have been developed to supply the large demand created by manufacturers of small metal parts to enable them to finish these parts in great quantities at very low cost.

Steel Balls.—An extremely interesting history of "The Evolution of the Steel Ball" is contained in an extensive pamphlet just issued by the Hoover Steel Ball Company, Ann Harbor, Mich. This work includes photographs and descriptions of the origin, use and method of manufacture of not only steel balls, but also of balls made of other materials such as brass, bronze, copper and aluminum. The matter contained in the pages of this work would prove of great value to all users of balls of various kinds and for different purposes. Copies of the booklet may be had upon request.

Grinding Machinery.—The Mine and Smelter Supply Company, New York, has recently issued catalog No. 42 which is devoted to descriptions and illustrations of the Marcy Mill. This mill is of the ball type and in its improved form as perfected by F. E. Marcy, was the first to remove the impression held so long by metallurgists that ball mills are undesirable for wet crushing of ores. It is stated, by the company, that this mill is particularly effective for use in foundries and casting shops for the reduction of metal bearing materials for the subsequent saving of the metal content.

A War Message.—The Syracuse Smelting Works, Brooklyn, N. Y., has issued an impressive war message to industrial workers throughout the United States in the form of a letter from Citizen Soldier No. 258, which is printed in colors on a stiff card suitable for hanging up. The lesson drawn from the message as expressed on the card is as follows: "Men, we must WORK—we must work with a frenzy that is born of inspiration. There shall be no clock to tell the hour of rest, no day, no night. They shall have food. They shall have care. They shall have clothes for their bodies and weapons for their hands. They shall have without failure, supplies and equipment in a stream that is constant and never ending."

Belts.—"The Proper Care of Belts" is the title of a new booklet gotten out by the Joseph Dixon Crucible company.

As long as the original condition of life and pliability of a belt is preserved it is worth its cost price. To neglect belts will result in a two fold loss: a waste of power due to the inefficiency of the belts; and increased cost due to frequent belt renewals. Just now as never before it is essential that belting be given careful attention. The booklet contains helpful suggestions for getting maximum results from belts and in addition has several pages devoted to useful information of a general character.

Those interested should write to The Joseph Dixon Crucible Company, Jersey City, N. J.

Tools.—The Ready Tool Company., Bridgeport, Conn., manufacturers of "the tool with the tool steel bearing" have just published their Quick Reference Catalog No. 16. This catalog illustrates and describes their chrome nickle lathe tools with the tool steel bearing; shaper and planner tools; tool holder for bench and watch lathes, which is the smallest tool holder on the market; boring tool holders; boring bars and internal threading tools; cutting off tools; threading tools; side tools; shaper or milling machine vise hold downs; lathe dogs; milling machine dogs; tail grinder dogs; balanced grinder dogs; handy holders; the Hill holdback dog; belt sticks; high speed steel cutters; and lastly a price list of extra cutters. This catalog which is small enough to be carried around in one's lower case pocket, will be sent to any reader of this publication upon request.

CATALOG EXHIBIT

An exhibition of every kind of catalog may be seen at The Metal Industry office, 99 John street, New York. The Metal Industry is prepared to do all the work necessary for the making of catalogs, pamphlets, circulars and other printed matter. Estimates will be furnished for writing descriptions, making engravings, printing, binding, for the entire job from beginning to end or any part of it.

METAL STOCKS MARKET QUOTATIONS

NEW YORK, June 10, 1918.

	Par	Bid	Asked
Aluminum Company of America	$100	500	600
American Brass	100	232	237
American Hardware Corp.	100	125	130
Bristol Brass	25	40	42
Canadian Car & Foundry, com.	100	28	32
Canadian Car & Foundry, pfd.	100	75	78
Eagle Lock	25	70	75
International Silver, com.	100	40	50
International Silver, pfd.	100	74	78
New Jersey Zinc	100	228	232
Rome Brass & Copper	100	310	340
Scovill Manufacturing	100	480	490
Standard Screw, com.	100	280	290
Standard Screw, "A" pfd.	100	100	110
Yale & Towne Mfg. Co.	100	205	215

Corrected by J. K. Rice, Jr., & Co., 36 Wall street, New York.

GOVERNMENT FIXES METAL PRICES

JUNE 10, 1918.

The Price-Fixing Committee of the War Industries Board has announced that the President has approved the prices to be paid by the Government for the following metals:

COPPER.

The copper prices of 23.50 per pound for carloads and 24.675 for less than carloads, which have prevailed since last September will be continued until August 15.

ZINC.

The price of zinc for a period until next September is as follows:

Grade A—12 cents; freight free on board plant, 14 cents; sheet free on board plant, 15 cents. The prices are subject to the usual trade discounts and differentials in effect on February 13 last.

The price was fixed under an agreement with the industry by which producers will not reduce wages. It will be the same for the public, the Allies and the Government. The War Industries Board will direct distribution to prevent zinc from falling into the hands of speculators. Producers pledged themselves to exert every effort to keep up production to insure an adequate supply.

ALUMINUM.

The maximum base price for aluminum, effective June 1, 1918, to September 1, 1918, shall be 33 cents per pound, free on board United States producing plants, for fifty tons and over of ingot of 98 to 99 per cent.

Differentials for sheet, rod, and wire will be increased by approximately 12½ per cent. Differentials for quality and grade and differentials for alloys will remain as heretofore, namely, those approved by the Price-Fixing Committee on March 3, 1918. Copies of the new list of differentials may be obtained upon application to the Non-ferrous Metals Section of the War Industries Board.

METAL MARKET REVIEW

WRITTEN FOR THE METAL INDUSTRY BY W. T. PARTRIDGE.

JUNE 10, 1918.

COPPER.

The Government prices and regulations of copper that have prevailed since last September were continued to August 15 next, at the recent meeting in Washington and in which the interest of the industry was centered for so long, namely, 23.50c. per pound for carloads and 24.67½c. for less than carloads. Government requirements continue to be enormous and consumers are eager buyers of as large quantities as may be obtained for shipments before June 25, when the 25 per cent. increase in freight rates becomes effective.

TIN.

Business in tin was difficult to transact in early May, for any position or for any grade of metal. With shipments of Banca held up, licenses for Straits exhausted and permits of English L. & F. limited, the only tin available was Chinese metal, No. 1 and No. 3, prices ranging from $1 to $1.10 per pound, according to delivery and grade. At the close spot Chinese No. 1 was held at 95c. to 96c. New York and at 87c. to 88c. Pacific coast. English L. & F. now afloat was 93c. per pound and prompt shipments from England 88c. per pound.

Arrivals were 1,955 tons; at Atlantic ports 1,145 tons; at Pacific ports 810 tons. Bolivian fine tin in April amounted to 1,408 tons, making a total of 4,639 tons for 1918, to May 1.

LEAD.

After a further decline in prices in a very quiet market at the beginning of the month, interest in lead was revived and with a moderate volume of business being steadily transacted, prices advanced beyond the level of the "Trust"—7.00c. New York, 6.92½c. E. St. Louis and which was unchanged throughout the month—to 7.10@7.30c. New York, 6.95@7.05c. E. St. Louis; the future outlook being most encouraging. Lead ore advanced $5 per ton to $85 not long before the close.

SPELTER.

Marked improvement in the spelter market during May was noted with rising prices that advanced from 6.90c. New York, 6.70c. St. Louis basis for prompt western shipment to 7.40@7.50c. New York, 7.20@7.30 St. Louis at the close. Brass special was dull at 7.50c. per pound.

ALUMINUM.

A new maximum base price, 33c. per pound f. o. b. United States producing plants, for 50 ton lots and over, for ingots 98 to 99 per cent., was established by the Government to become effective June 1 until September 1, late in May. Prices on all grades of scrap aluminum, subject to the Aluminum Company differentials, were established May 14 at 32c., 32.10c. and 32.20c. for fifty tons and over, for carloads and for one to fourteen-ton lots, respectively.

ANTIMONY.

Prices of antimony, under active buying during early May advanced to 13.00c. per pound, duty paid from 12.50@12.75c. the April closing. With Government announcement to several firms that bids were too high on the 1,000 tons wanted, the trade was left in the dark as to the successful bidder and also as to the price paid by the Government. Immediately following, prices gradually declined to 12.00@12.37½c. by the end of the month.

SILVER.

The price of silver during May declined ⅛c. per fine ounce to 99½c. on the second day, after which there was no change. Toward the close of the month it was reported that of the $350,000,000 held in the U. S. Treasury, $40,000,000 had been turned into bullion, in accordance with the bill recently passed by Congress. Much of this bullion is being exported directly or indirectly to India to equalize the trade balance between that country and Great Britain.

QUICKSILVER.

With the Government price for quicksilver fixed at $105 per 75-pound flask, prices to other consumers during May declined from $120@125 per flask to $115@120 by the second week, after which there was no change. The domestic market will be governed by supply and demand with the maximum limit established at $135@140 per flask.

PLATINUM.

The nation's entire supply has been commandeered by the Government with prices fixed at $105 per troy ounce for platinum; $175 for iridium and $135 for palladium. Compensation for alloys scraps, and sweeps covered by the requisition will be determined upon analysis and be paid for in accordance therewith. Stocks requisitioned include settlings, bezels and findings containing any percentage of these metals; plate wire, guaze, sponge, tubing sheets and chloride in partly manufactured products; scraps and filings, ores, concentrates or mixtures and manufactured articles or those in process, containing any of the three metals.

U. S. Government figures show 1917 production of crude platinum from placer mining to have been only 605 ounces, a falling off of 100 ounces. from the year previous. Imports of crude metal were 52.721 ounces, including the 21,000 ounces of Russian platinum received late in December, 1917. Refined production was 33,000 ounces platinum and 210 ounces of iridium, about 7,400 ounces of which originated from domestic materials. Saving of scrap platinum resulted in a total of 72,000 ounces, an increase of 24,000 over recoveries in 1916.

OLD METALS.

Old metals in May, after being quiet at unchanged April prices over the first ten days, developed into considerable activity during the following fortnight with prices advanced 4c. per pound on new aluminum to 30@31c.; 2c. per pound on old cast aluminum to 22@23c.; light copper, heavy lead and stereotype were up ¼c., while uncrucibled copper wire and No. 1 composition turnings were up ½c. At the close, quiet again reigned with a decline of 5c. per pound on block tin pipe to 70@75c. per pound. Lead, type shells, die cast and monel scrap were in good demand, there being a scarcity of type scrap. Brass turnings were sold in large quantities to Western buyers.

WATERBURY AVERAGE

Lake Copper. Average for 1917—30.97. 1918—January, 23.50. February, 23.50. March, 23.50. April, 23.50. May, 23.50.

Brass Mill Spelter. Average for 1917—11.116. 1918—January, 9.60. February, 9.60. March, 9.40. April, 8.50. May, 8.95.

MAY MOVEMENTS IN METALS

	Highest.	Lowest	Average
COPPER:			
Lake	*23.50	*23.50	*23.50
Electrolytic	*23.50	*23.50	*23.50
Casting	*23.50	*23.50	*23.50
TIN	market nominal; no metal offering		
LEAD	7.30	7.00	7.099
SPELTER (Brass Special)	7.625	6.875	7.406
ANTIMONY	13.00	12.00	12.406
ALUMINUM	32.10	32.10	32.10
QUICKSILVER (per flask)	$125.00	$115.00	$118.636
SILVER (cts. per oz.)	99⅝	99½	99.505

*Government price.

INQUIRIES AND OPPORTUNITIES

Under the directory of "Trade Wants" (published each month in the rear advertising pages), will be found a number of inquiries and opportunities which, if followed up, are a means of securing business. Our "Trade Want Directory" fills wants of all kinds, assists in the buying and selling of metals, machinery, foundry and platers' supplies, procures positions and secures capable assistants. See Want Ad. pages.

Metal Prices, June 10, 1918

NEW METALS

COPPER—DUTY FREE. PLATE, BAR, INGOT AND OLD COPPER. Manufactured 5 per centum.

Electrolytic, carload lots, nom. } Lake, carload lots, nominal... }	Government price.	23½
Casting, carload lots, nominal		23½

TIN—Duty Free.

Straits of Malacca, carload lots	none offered

LEAD—Duty Pig, Bars and Old, 25%; pipe and sheets, 20%. Pig lead, carload lots 7.125

SPELTER—Duty 15%.

Brass Special	7.50
Prime Western, carload lots, nominal	7.50

ALUMINUM—Duty Crude, 2c. per lb. Plates, sheets, bars and rods, 3½c. per lb.

Small lots, f. o. b. factory	....
100-lb., f. o. b. factory	....
Ton lots, f. o. b. factory.....Government price.	33.00

ANTIMONY—Duty 10%.

Cookson's, Hallet's or American	Nominal
Chinese, Japanese, Wah Chang WCC, brand spot	12¼

NICKEL—Duty Ingot, 10%. Sheet, strip and wire, 20% ad valorem.

Shot or Ingots	40 to 43c.

ELECTROLYTIC—5 cents per pound extra.

MANGANESE METAL	Nominal
MAGNESIUM METAL—Duty 20% ad valorem (100 lb. lots)	$1.90
BISMUTH—Duty free	3.50
CADMIUM—Duty free	nominal 1.45
CHROMIUM METAL—Duty free	.75
COBALT—97% pure	3.00
QUICKSILVER—Duty 10% per flask of 75 pounds	119.00
PLATINUM—Duty free, per ounce	105.00
SILVER—Government assay—Duty free, per ounce	.99½
GOLD—Duty free, per ounce	20.67

INGOT METALS

Silicon Copper, 10%	according to quality	50	to55
Silicon Copper, 20%	" "	50	to55
Phosphor Copper, guaranteed 15%	" "	57	to62
Phosphor Copper, guaranteed 10%	" "	55	to60
Manganese Copper, 30%, 2% Iron	" "	65	to72
Phosphor Tin, guaranteed, 5%	" "	1.25	to1.30
Phosphor Tin, no guarantee	" "	1.10	to1.15
Brass Ingot, Yellow	" "	17	to19
Brass Ingot, Red	" "	25	to26
Bronze Ingot	" "	24½	to25½
Parsons Manganese Bronze Ingots	" "	30½	to32
Manganese Bronze Castings	" "	40	to50
Manganese Bronze Ingots	" "	26	to30
Phosphor Bronze	" "	24	to30
Casting Aluminum Alloys	" "	38	to39

OLD METALS

Buying Prices.	Selling Prices.
22.00 Heavy Cut Copper	23.50
22.00 Copper Wire	23.50
19.00 Light Copper	21.00
21.00 Heavy Mach. Comp	23.50
14.00 Heavy Brass	16.00
10.50 Light Brass	12.50
13.00 No. 1 Yellow Brass Turning	13.50
18.00 No. 1 Comp. Turnings	21.00
6.00 Heavy Lead	6.50
5.25 Zinc Scrap	5.70
10.00 to 13.00 Scrap Aluminum Turnings	11.00 to 14.00
19.00 to 21.50 Scrap Aluminum, cast alloyed	21.00 to 23.00
26.00 to 28.00 Scrap Aluminum, sheet (new)	28.00 to 30.00
55.00 No. 1 Pewter	60.00
22.00 to 23.00 Old Nickel anodes	25.00 to 26.00
30.00 to 32.00 Old Nickel	34.00 to 36.00

PRICES OF COPPER SHEET

Mill shipments (hot rolled) ..... 32½c. base net
From stock ..... 34½c. base net

The following table shows the advance in cents per pound over the base price of copper sheet of various grades, lengths and widths.

SIZE OF SHEETS.		64 oz. and over.	32 oz. to 64 oz.	24 oz. to 32 oz.	16 oz. to 24 oz.	15 oz.	14 oz.	13 oz.	12 oz.	11 oz.
Width.	LENGTH.	CENTS PER LB.				CENTS PER LB. OVER BASE.				
Not wider than 30 ins.	Not longer than 72 inches.	Base	Base	Base	Base	½	1	1½	2	2½
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	½	1	2	3	4½
	Longer than 96 inches. Not longer than 120 inches.	"	"	½	1	2	3	5	7	
	Longer than 120 ins.	"	"	1	1½					
Wider than 30 ins., but not wider than 36 inches.	Not longer than 72 inches.	"	"	Base	Base	1	2	3	4	6
	Longer than 72 inches. Not longer than 96 inches.	"	"	"	"	1	2	4	6	8
	Longer than 96 inches. Not longer than 120 inches.	"	"	1	2	3	4			
	Longer than 120 inches.	"	1	2	3					
Wider than 36 ins., but not wider than 48 inches.	Not longer than 72 inches.	"	Base	1	2	3	4	6	8	9
	Longer than 72 inches. Not longer than 96 inches.	"	"	1	3	4	5	7	9	
	Longer than 96 inches. Not longer than 120 inches.	"	"	2	4	6	9			
	Longer than 120 inches.	"	1	3	6					
Wider than 48 ins., but not wider than 60 inches.	Not longer than 72 inches.	"	Base	1	3	5	7	9	11	
	Longer than 72 inches. Not longer than 96 inches.	"	"	2	4	7	10			
	Longer than 96 inches. Not longer than 120 inches.	"	1	3	6					
	Longer than 120 inches.	1	2	4	8					
Wider than 60 ins., but not wider than 72 ins.	Not longer than 96 inches.	Base	1	3	8					
	Longer than 96 inches. Not longer than 120 inches.	"	2	5	10					
	Longer than 120 inches.	1	3	8						
Wider than 72 ins., but not wider than 108 ins.	Not longer than 96 inches.	1	3	6						
	Longer than 96 inches. Not longer than 120 inches.	2	4	7						
	Longer than 120 inches.	3	5	9						
Wider than 108 ins., but not wider than 120 ins.	Not longer than 120 inches.	4	6							
	Longer than 120 ins.	5	8							
Wider than 120 ins., but not wider than 132 ins.	Not longer than 132 ins.	6	9							
	Longer than 132 ins.	7								
Wider than 132 ins.		8								

[The insert shows the extras on copper sheets from 10, 9, 8 and less than 8 oz. in weight, and various lengths and widths.]

Width.	LENGTH.	10 oz.	9 oz.	8 oz.	Less than 8 oz.
Not wider than 30 ins.	Not longer than 72 inches.	3	4½	6	9
	Longer than 72 inches. Not longer than 96 inches.	6	7½	9	
Wider than 30 ins., but not wider than 36 ins.	Not longer than 72 inches.				
	Longer than 72 inches. Not longer than 96 inches.				
Wider than 36 ins., but not wider than 48 ins.	Not longer than 72 inches.				

The longest dimension in any sheet shall be considered as its length.

Metal Prices, June 10, 1918

Extras for Copper Sheets.

Circles, 8 in. diameter and larger, segments and pattern sheets, advance per pound over prices of sheet copper required to cut them from..... 3c.

Circles less than 8 in. in diameter, advance per pound over prices of sheet copper required to cut them from..... 2c.

Cold or hard rolled copper, 14 oz. per square foot and heavier, advance per pound over foregoing prices..... 1c.

Cold or hard rolled copper, lighter than 14 oz. per square foot, advance per pound over foregoing prices..... 2c.

Cold rolled annealed copper, the same price as cold rolled copper.

All polished copper, 20 in. wide and under, advance per square foot over the price of cold rolled copper..... 1c.

All polished copper, over 20 in. wide, advance per square foot over the price of cold rolled copper..... 2c.

For polishing both sides, double the above price.

The polishing extra for circles and segments to be charged on the full size of the sheet from which they are cut.

Cold rolled copper, prepared suitable for polishing, same prices and extras as polished copper.

All planished copper, advance per square foot over the prices for polished copper ..... 1c.

Tinning.

Tinning sheets on one side, all sizes, per square foot.... 5c.

For tinning both sides double the above price.

Extra for tinning or polishing circles and segments, to be charged on the full size of the sheet from which they are cut.

For tinning edges of sheets, one or both sides, prices shall be the same as for tinning all of one side of the specified sheet.

Oval Copper Bottoms.

Tinned One Side.

16 oz. to square foot and heavier, per pound.....Base
15 oz. to square foot per lb., advance over base..... ½c.
14 " " " " " " " " " .....1c.
13 " " " " " " " " " .....1½c.
12 " " " " " " " " " .....2c.
11 " " " " " " " " " .....3c.
10 " " " " " " " " " .....4c.
Lighter than 10 oz. to square foot, per pound .....7c.

Round copper bottoms, tinned one side, 8 in. (203.2) diameter to 17 in. (431.8) diameter, both inclusive, 1c. per lb. advance over ovals.

Copper circles, tinned one side, less than 8 in. (203.2) diameter, 3c. per lb. additional.

Copper circles, tinned one side, over 17 in. (431.8) diameter, not classed as copper bottoms.

Polished oval and round tinned copper bottoms, same advance as for sheets.

Copper Anodes or Battery Plates Not Larger Than 20 x 30.

⅜ in. (9.5) and thicker, untrimmed..... lb.
⅜ in (9.5) and thicker, trimmed to size..... lb.

If drilled, full weight before drilling to be charged.

Nickel-Plated Copper.

Net Cash Prices.

Sheets 14 x 48 (355.6 x 1219.2) inches.

	Advance over base per lb.	Plating per sheet
14 and 16 oz. and heavier, by the case of 500 pounds and over.....	6c.	40c.
14 and 16 oz. and heavier, less than one case	7c.	42c.
12 oz. and lighter, by the case.....	8c.	40c.
12 oz. and lighter, less than one case.....	9c.	42c.

Boiler Sizes.

Over 12 (.40) Oz.

By the case of 500 lbs., 7 in (177.8) (14 x 52) (355.6 x 1320.8)	6c.	45c.
By the case of 500 lbs., 8 in. (203.2) (14 x 56) (355.6 x 1422.4)	6c.	45c.
By the case of 500 lbs., 9 in. (227.6) (14 x 60) (355.6 x 1523.6)	6c.	50c.

For less quantity than one case, add 2c. per lb.; 12 oz. and lighter, add 3c. per lb.

Tinning.

For copper nickel plated on one side and tinned on the other, add for
All sizes, per square foot.....3½c.

Note.—The figures in heavy face type in all cases represent metric measurements.

BARE COPPER WIRE—CARLOAD LOTS

26½c. per lb. base.

SOLDERING COPPERS

300 lbs. and over in one order.....38c. per lb. base
100 lbs. to 300 lbs. in one order.....39c. " " "
Less than 100 lbs. in one order.....40½c. " " "

SEAMLESS COPPER TUBING

38 to 41c. per lb. base.

BRASS MATERIAL—MILL SHIPMENTS

In effect January 3, 1918.

To customers who buy 5,000 lbs. or more per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.28	$0.31	$0.33
Wire	.28	.32	.34
Rod	.26	.32	.34
Brazed tubing	.36	..	.41
Open seam tubing	.36	..	.41
Angles and channels.....	.36	..	.41

To customers who buy less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.29½	$0.32½	$0.34½
Wire	.29½	.33½	.35½
Rod	.27½	.33½	.35½
Brazed tubing	.37½	..	.42½
Open seam tubing	.39½	..	.42½
Angles and channels.....	.37½	..	.42½

[Note.—Net extras for quality for both sections of above metal prices are not quoted due to the fluctuations in the price of zinc.—Ed.]

SEAMLESS BRASS TUBING

35½ to 38½ base.

SEAMLESS BRASS TUBING—IRON PIPE SIZES

35½ to 38½ base.

IRON LINED TUBING—NOT POLISHED

Due to fluctuations of the metal market we are unable to quote these prices.

TOBIN BRONZE AND MUNTZ METAL

Tobin Bronze Rod..... 33½c. net base
Muntz or Yellow Metal Sheathing (14" x 48") 30c. " "
Muntz or Yellow Metal Rectangular sheets other than Sheathing ..... 33c. " "
Muntz or Yellow Metal Rod ..... 31c. " "

Above are for 100 lbs. or more in one order.

Metal Prices, June 10, 1918

ZINC SHEET

Duty, sheet, 15%. Cents per lb.

Carload lots, standard sizes and gauges, at mill, 15c. basis, less 8%

Casks, jobbers' prices....16½c.

Open casks, jobbers' prices....17c.

The above mill prices have been fixed by the United States Government, applying to civilian population of the United States and allied governments.

ALUMINUM SHEET, ROD AND WIRE

Sheet Aluminum, outside market contract base price, 40c. per pound.

FLAT SHEET

Gauge		Price in Cents per Lb. 1 Ton Lots	15 Ton Lots	50 Ton Lots
Nos. 18 and heavier	3" to 60"	42.40	42.20	42.00
Nos. 19 and 20	3" to 60"	43.50	43.30	43.10
Nos. 21 to 24, incl.	3" to 30"	45.80	45.60	45.40
	30" to 48"	48.00	47.80	47.60
	48" to 60"	51.40	51.20	51.00
Nos. 25 and 26	3" to 30"	49.20	49.00	48.80
	30" to 48"	51.40	51.20	51.00
No. 27	3" to 30"	50.30	50.10	49.90
	30" to 48"	53.70	53.50	53.30
No. 28	3" to 30"	52.50	52.30	52.10
	30" to 48"	55.90	55.70	55.50
No. 29	3" to 30"	55.90	55.70	55.50
	30" to 48"	60.40	60.20	60.00
No. 30	3" to 30"	58.20	58.00	57.80

ROD.

B. & S. Gauge.

¼" to 1" Advancing by 32nds
1" to 5⅛" " " 16ths } 98% rolled, 43.10 cents per lb.
2⅝" to 3½" " " 8ths

⅜" to ¼", 98% rolled and drawn....48.80 cents per lb.

WIRE.

Definition: Round—less than ⅜" diameter. Other shapes—less than ⅜" greatest diameter.

B. & S. Gauge.	Spools.	Price in Cents Per Lb. On Spools.	In Coils.
Nos. 2 to 10, inclusive	50 lb.	$.465	$.437
Nos. 11 and 12	50 lb.	.499	.465
Nos. 13 and 14	35 lb.	.533	.493
Nos. 15 and 16	20 lb.	.611	.549
Nos. 17 and 18	20 lb.	.689	.606
Nos. 19 and 20	10 lb.	.714	.718
No. 21	10 lb.	.815	.803
No. 22	10 lb.	1.050	.915
No. 23	10 lb.	1.185	1.028
No. 24	5 or 2 lb.	1.421	....
No. 25	5 or 2 lb.	1.646	....
No. 26	5 or 2 lb.	1.928	....
No. 27	1 lb.	2.321	....
No. 28	1 lb.	2.771	....
No. 29	½ lb.	3.840	....
No. 30	½ lb.	5.021	....

GRADE "B" NICKEL SILVER SHEET METAL

Quality.	Net per lb.	Quality.	Net per lb.
5%	42½c.	16%	47c.
8%	43½c.	18%	47½c.
10%	43¾c.	20%	49¼c.
12%	45½c.	25%	57c.
15%	49c.	30%	62½c.

NICKEL SILVER WIRE

Quality.	Net per lb.	Quality.	Net per lb.
5%	44c.	15%	52c.
8%	46c.	16%	52½c.
10%	48c.	18%	54½c.
12%	50c.	30%	70c.

The above Base Prices are subject to additions for extras as per list printed in Brass Manufacturers' Price List and from such extras 50% discount will be allowed. The above base prices and discounts are named only to wholesale buyers who purchase in good quantities. Prices on small lots are correspondingly higher.

BLOCK TIN SHEET AND BRITANNIA METAL

Block Tin Sheet—18" wide or less. No. 26 B. & S. Gauge or thicker. 100 lbs. or more, 10c. over Pig Tin. 50 to 100 lbs., 15c. over 25 to 50 lbs., 17c. over, less than 25 lbs., 25c. over.

No. 1 Britannia—18" wide or less. No. 26 B. & S. Gauge or thicker. 100 lbs. or more, 10c. over Pig Tin. 50 to 100 lbs., 12c. over, 25 to 50 lbs., 15c. over, less than 25 lbs., 25c. over.

Above prices f. o. b. mill.

Prices on wider or thinner metal on request.

LEAD FOIL

Base price—5.75 cents per lb.

TIN FOIL

Base price—No quotation.

PLATERS METALS

Platers' bar in the rough, 65c. net.

Nickel silver platers' bars dependent on the percentage of nickel, quantity and general character of the order.

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturer.

SILVER SHEET

Rolled silver anodes .999 fine are quoted at —— above the price of bullion. Manufacturers state that as silver is selling at a premium at the present time they are unable to give any quotation.

NICKEL ANODES

85 to 87% purity....52½c. per lb.
90 to 92% " ....55c. " "
95 to 97% " ....57½c. " "

Supply Prices, June 10, 1918

CHEMICALS

Acid—		
Boric (Boracic) Crystals	lb.	.25
Hydrochloric (Muriatic) Com., 18 deg.	lb.	.08
Hydrochloric, C. P., 22 deg.	lb.	*.16
Hydrofluoric, 30%	lb.	.40
Nitric, 36 deg.	lb.	.09¼
Nitric, 42 deg.	lb.	.11⅛
Sulphuric, 66 deg.	lb.	.08
Alcohol—		
Denatured	gal.	1.00
Alum—		
Lump	lb.	.09
Powdered	lb.	.15
Aluminum sulphate, iron free	lb.	.15
Aluminum chloride solution	lb.	.16
Ammonium—		
Sulphate, tech.	lb.	.10
Sulphocyanide	lb.	—
Arsenic, white	lb.	—
Argols, white, see Cream of Tartar	lb.	.75
Asphaltum	lb.	.35
Benzol, pure	gal.	1.00
Blue Vitriol, see Copper Sulphate.		
Borax Crystals (Sodium Biborate)	lb.	.15
Calcium Carbonate (Precipitated Chalk)	lb.	.15
Carbon Bisulphide	lb.	.20
Chrome Green	lb.	—
Cobalt Chloride	lb.	—
Copper—		
Acetate (Verdigris)	lb.	—
Carbonate	lb.	.40
Cyanide	lb.	.65
Sulphate	lb.	.17
Copperas (Iron Sulphate)	lb.	.06
Corrosive Sublimate, see Mercury Bichloride.		
Cream of Tartar, Crystals (Potassium bitartrate)	lb.	.80
Crocus	lb.	.10
Dextrin	lb.	.25
Emery Flour	lb.	.10
Flint, powdered	ton	—
Fluor-spar (Calcic fluoride)	ton	—
Fusel Oil	gal.	—
Gold Chloride	oz.	12.00
Gum—		
Sandarac	lb.	—
Shellac	lb.	—
Iron Sulphate, see Copperas	lb.	.06
Lead Acetate (Sugar of Lead)	lb.	—
Yellow Oxide (Litharge)	lb.	.20
Mercury Bichloride (Corrosive Sublimate)	lb.	—
Nickel—		
Carbonate, dry	lb.	.80
Chloride	lb.	.70
Salts, single bbl.	lb.	.14
Salts, double bbl.	lb.	.13
Paraffin	lb.	.25
Phosphorus—Duty free, according to quality		nominal
Potash, Caustic (Potassium Hydrate)	lb.	—
Lump	lb.	—
Potassium Bichromate	lb.	—
Carbonate, 34-36%	lb.	—
Cyanide, 98-99½%	lb.	—
Sulphocyanide	lb.	—
Pumice, ground	lb.	—
Quartz, powdered	ton	—
Official	oz.	.73½
Rosin	lb.	.08
Rouge, nickel	lb.	.45
Silver and gold	lb.	.60
Sal Ammoniac (Ammonium Chloride)	lb.	—
Sal Soda	lb.	.05
Silver Chloride, dry	oz.	—
Cyanide	oz.	—
Nitrate, 100 ounce lots	oz.	66.83
Soda Ash, 58%	lb.	.08
Sodium—		
Biborate, see Borax	lb.	.15
Bisulphite	lb.	.15
Cyanide	lb.	.37
Hydrate (Caustic Soda)	lb.	.15
Hyposulphite	lb.	.08
Nitrate, tech.	lb.	.10
Phosphate	lb.	.14
Silicate (Water Glass)	lb.	.05
Soot, Calcined	lb.	—
Sugar of Lead, see Lead Acetate	lb.	.35
Sulphur (Brimstone)	lb.	.10
Tin, Chloride	lb.	.75
Tripoli Composition	lb.	.06
Verdigris, see Copper Acetate	lb.	—
Water Glass, see Sodium Silicate	lb.	.05
Wax—		
Bees, white ref. bleached	lb.	—
Yellow	lb.	*60
Whiting	lb.	.05
Zinc, Carbonate	lb.	.30
Chloride	lb.	.35
Cyanide	lb.	.50
Sulphate	lb.	.12

COTTON BUFFS

Open buffs, per 100 sections (nominal).

12 inch, 20 ply, 64/68, cloth	base,	$70.20
14 " 20 " 64/68 "	"	92.50
12 " 20 " 84/92 "	"	83.55
14 " 20 " 84/92 "	"	108.35

Sewed buffs per pound.

Bleached and unbleached	base,	52c.
Colored	"	49c

FELT WHEELS

White Spanish—

Diameter	Thickness	Price
6 to 9 inch	1 to 3 inch	$2.75 per lb.
10 to 16 "	1 to 3 "	2.65 " "
6 to 16 "	From ½ inch to less than 1 inch	2.95 " "
Over 16 "	Over 3 inch	2.75 " "
6 to 16 "	Under ½ inch	3.05 " "

Mexican Wheels—

Diameter	Thickness	Price
6 to 9 inch	1 to 3 inch	$2.65 per lb.
10 to 16 "	1 to 3 "	2.55 " "
6 to 16 "	From ½ inch to less than 1 inch	2.85 " "
Over 16 "	Over 3 inch	2.65 " "
6 to 16 "	Under ½ inch	2.95 " "

*Wholesale price.